Joint Publication 4-04

Joint Doctrine for Civil Engineering Support

27 September 2001

PREFACE

1. Scope

This publication provides the guidance and procedures necessary to plan, coordinate, and conduct timely and tailored joint civil engineering support across the range of military operations.

2. Purpose

This publication has been prepared under the direction of the Chairman of the Joint Chiefs of Staff. It sets forth doctrine to govern the joint activities and performance of the Armed Forces of the United States in joint operations and provides the doctrinal basis for US military involvement in multinational and interagency operations. It provides military guidance for the exercise of authority by combatant commanders and other joint force commanders (JFCs) and prescribes doctrine for joint operations and training. It provides military guidance for use by the Armed Forces in preparing their appropriate plans. It is not the intent of this publication to restrict the authority of the JFC from organizing the force and executing the mission in a manner the JFC deems most appropriate to ensure unity of effort in the accomplishment of the overall mission.

3. Application

a. Doctrine and guidance established in this publication apply to the commanders of combatant commands, subunified commands, joint task forces, and subordinate components of these commands. These principles and guidance also may apply when significant forces of one Service are attached to forces of another Service or when significant forces of one Service support forces of another Service.

b. The guidance in this publication is authoritative; as such, this doctrine will be followed except when, in the judgment of the commander, exceptional circumstances dictate otherwise. If conflicts arise between the contents of this publication and the contents of Service publications, this publication will take precedence for the activities of joint forces unless the Chairman of the Joint Chiefs of Staff, normally in coordination with the other members of the Joint Chiefs of Staff, has provided more current and specific guidance. Commanders of forces operating as part of a multinational (alliance or coalition) military command should follow multinational doctrine and procedures ratified by the United States. For doctrine and procedures not ratified by the United States, commanders should evaluate and follow the multinational command's doctrine and procedures, where applicable and consistent with US law, regulations, and doctrine.

For the Chairman of the Joint Chiefs of Staff:

S. A. FRY
Vice Admiral, U.S. Navy
Director, Joint Staff

Intentionally Blank

TABLE OF CONTENTS

FIGURE

Intentionally Blank

COMMANDER'S OVERVIEW

- **Describes the Roles, Functions, and Responsibilities for Civil Engineering Support**
- **Discusses Engineer Force Organizational Considerations and Provides Command and Control Options**
- **Discusses Civil Engineering Planning Considerations**
- **Provides Guidance on the Conduct of Civil Engineering Support Operations**
- **Provides Information on Civil Engineering Capabilities**
- **Discusses Environmental Considerations for Civil Engineering Support**

Role of Civil Engineering Support

Civil engineering support provides a force multiplier for the joint force.

Civil engineering is defined as those **combat support** or **combat service support** activities that identify, design, construct, lease, or provide facilities, and which operate, maintain, and perform war damage repair and other engineering functions in support of military operations. Civil engineering support provides a force multiplier that supports the mobilization, deployment, employment, sustainment, and redeployment of the joint force across the range of military operations.

Civil engineering support provides construction, maintenance, and improvements of port facilities, main supply routes, acquisition of real estate for staging and assembly areas, and facilities for long term sustainment of the joint force.

Civil engineering support is closely linked to the strategic and operational levels of war. Civil engineering supports the Joint Vision 2020 concept, "Focused Logistics 21st Century Challenge of Agile Infrastructure," by responsive engineer support across the range of military operations. This support includes the **construction** of US bases overseas and other such activities to support joint operations including the **improvement** of host nation (HN) infrastructure. Civil engineering support includes improvements to aerial ports of debarkation, seaports of debarkation, main supply routes (MSRs), **acquisition of real estate** for staging and assembly

areas, and providing facilities to satisfy long term sustainment requirements of the joint force.

Timely civil engineering support is essential to the conduct of joint operations.

Timely civil engineering support is essential to the joint force commander's (JFC's) ability to conduct successful joint operations. Civil engineering support functions and primary mission areas include: advanced base development and operations; pre-positioning support; support to joint reception, staging, onward movement, and integration (JRSOI); support to joint logistics over-the-shore (JLOTS) operations; battle damage repair; support to post hostilities operations; foreign humanitarian assistance and disaster relief; and specialized civil engineering support.

Command and Control

The joint force commander's (JFC's) engineer forces should be organized to ensure unity of effort, centralized planning, and decentralized execution.

Joint operations can present formidable engineering challenges. The JFC organizes the joint force to best accomplish the assigned mission based upon the concept of operations. The organization developed should be sufficiently flexible to meet the planned phases of the contemplated operation. Simplicity and clarity of command relationships are paramount to efficient and effective use of the civil engineering forces.

Command and control options for engineering forces include Service component command, functional component command, and a subordinate joint task force.

The JFC organizes the civil engineer forces to best accomplish the mission. With a **Service component command** structure, the component commanders maintain operational control of their Service engineering forces. This command and control (C2) structure maintains traditional command relationships and is advantageous when operations are conducted through Service component commanders and engineer forces are used in direct support of Service component missions. The JFC may also organize to accomplish the mission using one or more **functional component commands**. Under this option the JFC establishes command relationships for engineer forces based on the requirement for engineer missions. This option provides the JFC with the ability to tailor the engineer capabilities within the operational area to best achieve mission requirements. Some joint force operations are extremely engineer-intensive, requiring numerous engineer assets to accomplish the mission. To better orchestrate forces, the JFC may opt to establish a **subordinate joint task force** to control extensive engineer operations and missions. This option provides a coordinated approach to addressing engineer responsibilities.

Planning Considerations

Operation plans should leverage civil engineering forces and infrastructure.

Detailed and thorough planning is essential to effective civil engineering support for successful joint operations. Engineers should be involved in the earliest stages of the planning process.

At the strategic and operational levels, civil engineering operations involve the provision of facilities, infrastructure, and engineering support. Thorough civil engineering planning will enable the JFC to receive and sustain deploying forces.

Civil engineering support planning focuses on the mission, commander's intent, and concept of operations.

Preparation of the Civil Engineering Support Plan is essential to support the joint force.

The JFC's concept of logistics is a key part of the synchronization of the joint effort. Civil engineering support planning includes a determination of the requirements for civil engineering support and analysis of available facilities to fulfill those requirements. Development of the **Civil Engineering Support Plan (CESP)** ensures that essential civil engineering capabilities are identified and will be provided at the required locations and at the appropriate times to support the joint force. The culmination of civil engineering planning is the development of a comprehensive CESP that identifies essential civil engineering support required for joint operations.

Important factors that should be considered when planning civil engineering operations include: concept of operations to meet mission requirements; required engineering capabilities; available construction assets; type of construction material available within theater; construction standards; real property requirements; use of building systems; Service standard designs; use of construction contracting to meet mission requirements; and use of HN resources and multinational forces.

Operations

Civil engineering support operations enable joint force mission success.

Civil engineering support operations can encompass both large-scale tasks requiring design and logistic support as well as expedient operations in environments across the range of military operations.

Civil engineering support is provided to joint operations such as JRSOI, mobility and countermobility, advanced base development, JLOTS, force protection, and post hostilities operations and operations in support of rear area security and base defense. Civil engineering support operations facilitate

the acquisition, preparation, operation, repair, and recovery of real property assets. Civil engineering support is also provided to military operations other than war, including foreign humanitarian assistance, disaster relief, and domestic support operations.

The joint force engineer and staff must determine how civil engineering support operations can be effectively executed through each phase of a joint operation.

Civil engineering support should be planned and executed to meet the requirements of each phase of a campaign or major operation. Phasing assists the JFC and joint force engineer in defining civil engineering support requirements in terms of forces, resources, and time.

Civil engineering support operations during the **deter/engage** phase of a joint operation involves supporting advanced base construction. Civil engineering support during this phase focuses on providing the support, facilities, and infrastructure systems necessary to move, receive, and beddown deploying forces. During **seize initiative** and **decisive operations** phases, the civil engineering support mission to sustainment is essential to the conduct of subsequent joint operations. Civil engineers support mobility, countermobility, base defense, force protection construction support, and battle damage repair. The **transition** phase of a campaign or major operation represents transition from war to peace, and a shift from military engineering capabilities to other US Government organizations, nongovernmental organizations, international organizations, and HN or civilian contractor support.

Civil Engineering Capabilities

The Services possess distinct civil engineering forces and capabilities that are a vital resource to the JFC.

Within the Department of Defense, the Services' civil engineering forces have important civil engineering capabilities that support the JFC in accomplishing the mission. An understanding of the Services civil engineering capabilities allows the JFC and joint force engineer to tailor the engineer forces to effectively support the joint force. **The JFC should understand joint, multinational, and interagency engineer capabilities** in order to properly integrate them into joint operations. The joint force engineer provides recommendations to the JFC on the effective employment of civil engineering forces and capabilities in support of joint and multinational operations.

Army engineer units provide an extensive capability to plan and implement combat, civil, and topographic engineering missions to support joint and multinational operations across the full operational spectrum. Army engineer units provide key planning and coordination support in addition to the ability

to construct, maintain, and repair facilities, MSRs, heliports, ports, railroads, bridges, and lines of communications; conduct quarry operations; drill water wells; and perform real estate, environmental, and facility engineering functions.

Navy civil engineer units, organized primarily as Navy construction engineer **(SEABEE)** units, perform both generalized and specialized construction missions in support of Navy, Marine Corps, and joint forces. SEABEE units possess extensive vertical construction, bridging, and heavy earthmoving capabilities supporting the construction of roads for supply routes, ammunition supply points, expeditionary airfields, and all types of force beddown and logistic facilities. SEABEEs also possess the capability to erect elevated causeway systems, install ship-to-shore fuel and water hose systems, and assemble and operate causeway barge ferries for ship-to-shore logistic operations. Operationally, SEABEE units can operate as task-organized detachments. This flexible C2 structure allows SEABEEs to respond with the right level of engineering expertise at the right time in the right place.

Air Force engineer units are organized as Prime Base Engineer Emergency Force or as Rapid Engineer Deployable Heavy Operations Repair Squadron Engineer **(RED HORSE)** units. These units collectively provide the following capabilities: 1) extensive vertical and horizontal construction; 2) facility and infrastructure maintenance and repair; 3) aircraft fire, crash, and rescue support; 4) airfield systems support (e.g., lighting, navigational aids and arresting systems); 5) nuclear, biological, and chemical defense support; 6) force protection support; 7) explosive ordnance disposal; and 8) base denial. In addition, RED HORSE squadrons are organized and deployed for austere, independent operations.

The **Marine Corps** is an expeditionary force-in-readiness, organized primarily to provide combat engineering and civil engineering support to the three **Marine expeditionary forces** or smaller, task-organized **Marine air-ground task forces**.

Construction contracting also enhances the JFC's civil engineering forces and capabilities.

Besides military engineering forces and capabilities, the Army, Navy, and Air Force also use **construction contracting and engineering support that provides the JFC with a significant engineering capability** to be leveraged as a force multiplier by allowing the joint force military engineering forces to concentrate on tasks in high threat areas. Civil augmentation programs such as the Army's Logistics Civilian Augmentation Program, the Navy's Construction Capabilities Contract, and the Air Force Contract Augmentation Program

can play a significant role in mission accomplishment by providing the JFC and joint force engineer with additional options and flexibility in achieving timely civil engineering and logistic support to the joint force.

Environmental Considerations

JFCs should demonstrate proactive environmental leadership throughout the joint force.

JFCs are responsible for protecting the environment within which US military forces operate to the greatest extent possible consistent with operational requirements. JFCs should demonstrate proactive environmental leadership, instill environmental ethics, and promote environmental awareness throughout the joint force. The joint force engineer provides guidance to the JFC on environmental considerations in planning and executing joint operations.

CONCLUSION

During joint operations, engineers may be called upon to perform a variety of civil engineering tasks that support the joint force mission. Civil engineering support provides a force multiplier that enhances the combat capability of the joint force. At the strategic and operational levels, civil engineering operations involve the provision of facilities, infrastructure, and engineering support. Operation plans should leverage civil engineering forces and infrastructure in helping to shape the battlespace for the JFC. Civil engineering support should be planned and executed to meet the requirements of each phase of a campaign or major operation. Military engineering forces and construction contracting provide the JFC with a significant engineering capability and can play an important role in support of joint operations.

CHAPTER I
INTRODUCTION

"When I look back at the last ten years and particularly my time associated with US Joint Forces Command, I cannot recall when engineers have not been at the forefront of most military and humanitarian operations."

Remarks by Admiral Harold W. Gehman, Jr., Commander in Chief, US Joint Forces Command, in a speech to the Society of American Military Engineers, Mid-Atlantic Regional Conference, 13 April 2000, Norfolk, Virginia

1. General

a. **Overview.** During joint operations, engineers may be called upon to perform a variety of tasks that support the mission. These tasks may be categorized as **civil engineering, topographic engineering, or combat engineering**. Civil engineering support provides a force multiplier that supports the mobilization, deployment, employment, sustainment, and redeployment of the joint force across the range of military operations. Civil engineers enhance the combat capability of the joint force in each of the four phases of a combat operation: deter/engage, seize initiative, decisive operations, and transition.

b. **Relationship to Joint Publication (JP) 3-34.** A related joint publication, JP 3-34, *Engineer Doctrine for Joint Operations*, is the overarching publication explaining joint engineer fundamentals, command relationships, planning, and operations in a broader perspective. **JP 3-34 discusses combat, topographic, and general engineering,** whereas this publication provides commanders with detailed information regarding the conduct of civil engineering support operations. For the purpose of this publication, the terms "general engineering" and "civil engineering" will be considered synonymous.

Base camp and migrant facilities constructed by Navy, Air Force, Army, and Marine Corps engineers in support of Operation SEA SIGNAL at Guantanamo Bay, Cuba.

2. Role of Civil Engineering

Civil engineering support is closely linked to the strategic and operational levels of war, and vital to the successful

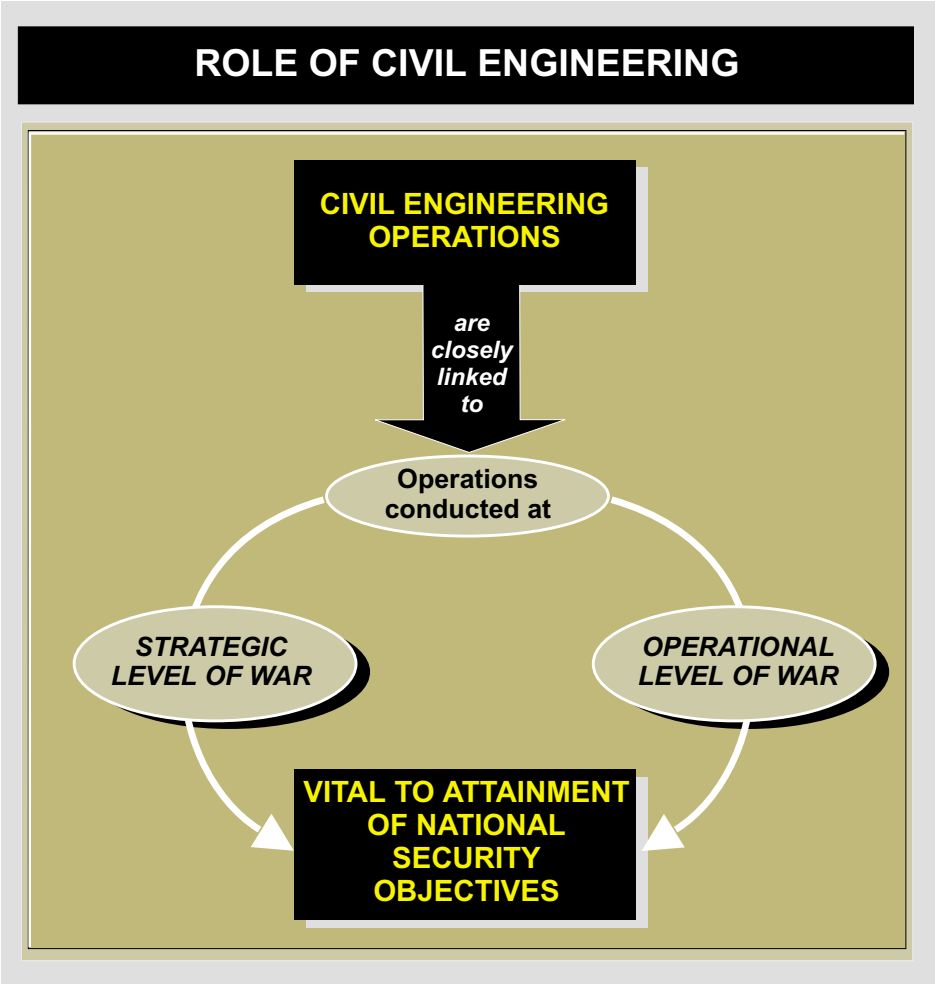


Figure I-1. Role of Civil Engineering

attainment of national security objectives (see Figure I-1).

a. **Strategic Level. Civil engineering operations are conducted to prepare an operational area for future joint operations.** Civil engineering operations are planned and conducted in support of geographic combatant commander's strategic concepts and operational area engagement plans, as well as in support of contingency operations. Civil engineering activities also assist the combatant commander and subordinate joint force commander (JFC) in preparing for future military operations. Support includes the improvement of host nation (HN) infrastructure, construction of US bases overseas, and other such activities to support joint and multinational operations. Engineering projects enhance the ability to project and sustain combat power. Due to their large scope, these projects are typically programmed and constructed during peacetime.

b. **Operational Level.** The JFC is responsible for establishing command and control (C2) relationships, including coordination of civil engineering in support of operational objectives. **Civil engineering**

operations should support the JFC's concept of operations and enhance logistic support in the operational area. Civil engineering support should address major facilities, construction policies, environmental considerations, and allocation of civil engineering resources in support of mobilization, deployment, employment, sustainment, and redeployment of the joint force across the range of military operations. Engineering assumptions should support the operational level requirements of all joint forces. Combatant commanders may exercise directive authority for logistics to ensure the effective use of limited civil engineering resources, to include the reallocation of these resources between Service components to achieve strategic and operational goals.

c. **Focused Logistics.** Focused logistics is one of four operational concepts, described in Joint Vision 2020, necessary to achieve full spectrum dominance in joint warfighting. **Focused logistics fuses information, logistics (including civil engineering), and transportation technologies to provide rapid crisis response.** Civil engineering supports the Joint Vision 2020 concept, "Focused Logistics 21st Century Challenge of Agile Infrastructure," by providing responsive engineering support across the full range of military operations. **Responsive engineering support** enables and enhances the rapid and effective flow of deploying forces, equipment, and sustainment into the operational area. Responsive engineering support is achieved through engineer forces that can rapidly improve existing infrastructure or replace it with alternative facility systems. Civil engineering support includes, but is not limited to: essential facility enhancements to improve airfields, ports, main supply routes (MSRs), and lines of communications (LOCs); acquisition of real estate for staging and assembly areas; and the provision of facilities through leasing and/or buying of existing facilities as well as new construction in order to satisfy force beddown, base development, and long term sustainment requirements of the joint force.

3. Civil Engineering Support Functions and Primary Mission Areas

Timely civil engineering support is essential to the JFC's ability to conduct successful joint operations. **The planning process and execution of civil engineering operations is consistent across the range of military operations.** Throughout the various phases of any operation, engineers provide the joint force with the means to achieve full spectrum dominance.

a. **Advanced Base Development and Operations.** All four Services' engineering units support advanced base development and operations. Engineer units may support advanced base development by the following means: erecting and maintaining force beddown facilities; providing systems improvements in support of joint logistics over-the-shore (JLOTS); constructing, repairing, and maintaining facilities; providing utility support; erecting bridges; installing bulk fuel and distribution systems; erecting prefab shelters; analyzing existing force protection capabilities and recommending areas requiring improvement to ensure protection of the force; and repairing and maintaining airfield pavements. Advanced base development includes construction of facilities in support of reception and staging facilities, rest and refit sites, airfield operations, and base camps for the joint force in the conduct of wartime operations and military operations other than war (MOOTW) such as foreign humanitarian assistance (FHA), disaster relief, and peace operations. Civil engineers enhance the survivability of the joint force by recommending to the JFC essential construction in support of force protection measures (e.g., hardening of essential facilities and utilities).

For additional information on advanced base development and operations, refer to Chapter IV, "Civil Engineering Support Operations."

b. **Pre-positioning Support.** Engineers assess infrastructure requirements to facilitate strategic deployment of the joint force to reception, staging, and marshalling areas as well as storage sites. When the assessment is complete and requirements are known, **engineers support pre-positioning through facility construction (to store materiel), real estate management, and various contracting methods**. Refer to specific Service appendices for information on pre-positioned engineer assets. Because existing HN capabilities can vary widely, especially at aerial ports of debarkation (APODs) and seaports of debarkation (SPODs), military engineers may supplement host-nation support (HNS) through civil augmentation programs, such as the Army's Logistics Civilian Augmentation Program (LOGCAP), the Navy's Construction Capabilities Contract (CONCAP) program and the Air Force Contract Augmentation Program (AFCAP). In support of the Navy and Marine Corps maritime pre-positioning force (MPF) program, Navy engineers provide the ship-to-shore movement of pre-positioned equipment of the MPF Marine expeditionary brigades, naval mobile construction battalions and naval expeditionary medical systems.

For additional information on contingency contracts, refer to Chapter V, "Civil Engineering Capabilities." For additional information on support to pre-positioning, refer to Chapter IV, "Civil Engineering Support Operations."

c. **Support to Joint Reception, Staging, Onward Movement, and Integration (JRSOI).** Engineering support to JRSOI covers a wide range of functions. The primary function is to obtain the real property needed for the reception, marshalling, and staging areas. Civil engineering support involves the evaluation of the quantity and type of HN facilities available for offloading and staging of personnel, equipment, and supplies. **Civil engineering support operations may include the construction, improvement, and maintenance of APOD and SPOD facilities.** Construction in support of force protection and antiterrorist measures in vulnerable marshalling and staging areas are also high priority tasks. Engineers may also be called upon to establish and maintain MSRs to support the onward movement. An engineering survey of the transportation infrastructure will be needed to evaluate roads,

Marine Corps engineers erect a prefab building called a tension fabric structure.

bridge limitations and/or restrictions, rail lines, airfields, and tunnels. **JRSOI can be a major consideration in all four operational phases.**

For additional information on engineering support to JRSOI, refer to Chapter IV, "Civil Engineering Support Operations."

d. **Support to Joint Logistics-Over-the-Shore Operations.** Engineer support to JLOTS operations will be considerable. **Civil engineering operations support the preparation of JLOTS operations for movement of material from maritime vessels to ground transportation assets.** This may include, but is not limited to, shore stabilization, site grading, drainage, facility construction and improvements at SPODs, environmental damage mitigation, and utility installation. Civil engineering operations may also include the assembly and insertion of pontoon causeways, elevated causeways, and petroleum distribution systems.

For additional information on civil engineering support to JLOTS, refer to Chapter IV, "Civil Engineering Support Operations."

e. **Battle Damage Repair.** Civil engineering activities support base recovery after attack and critical infrastructure repairs to MSRs, airfields, port facilities, and utility systems. Civil engineering tasks may also include emergency repair of damaged property or structures that may be used by the HN. More permanent repairs can be planned and executed as mission requirements warrant. Battle damage repair typically occurs during seize initiative, decisive operations, and transition phases of an operation.

For additional information on battle damage repair, refer to Chapter IV, "Civil Engineering Support Operations."

f. **Support to Transition Operations.** During transition, civil engineering operations may provide support to areas including (but not limited to) FHA, disaster relief, and redeployment. It should be noted that FHA and disaster relief can be provided during all phases of a joint operation.

- **FHA and Disaster Relief.** Engineers are a vital asset in FHA and disaster relief. The level of assistance can vary from small, highly specialized teams to complete engineer units. Small teams are used to assess damage or estimate engineering repairs, and can assist in specialized support such as power supply and distribution, utilities repair work, water purification, and well drilling operations. In large disaster relief and FHA operations, engineer units provide essential civil engineering support including facility construction, structural repair, debris clearance, emergency repairs to restore utilities, and camp construction for deployed forces and dislocated civilians. In addition to the tasks outlined above, **engineers play a key role in the transition to civil authorities**. For example, the joint force engineer and staff may participate in the civil-military operations center (CMOC) that serves as the interface between civil and military authorities. Recent trends indicate that coordination with civilian agencies and nongovernmental organizations (NGOs) will be essential to success in future joint operations. Therefore, knowledge and understanding on how to transition operations to these civilian agencies is increasingly important.

  For additional information on interagency coordination, refer to JP 3-08, Interagency Coordination During Joint Operations, Vol I & II; *JP 3-57,* Doctrine for Joint Civil-Military

Operations*; and JP 3-57.1*, Joint Doctrine for Civil Affairs.

- **Redeployment.** During planning, commanders must understand that redeployment can be a significant engineering challenge, particularly when terminating overseas contingency operations. Civil engineering operations support force redeployment through the preparation of facilities for retrograde, completion of construction projects, and the refurbishment and turnover of property and real estate to the HN. Additionally, engineers terminate leases and facility contracts, construct wash racks and other redeployment facilities, prepare collection points, and coordinate for the safe disposition of hazardous materials (HAZMATs). Commanders and civil engineers must be aware of legal considerations involved in these redeployment activities.

g. **Environmental Considerations.** Environmental considerations are important in all phases of joint operations. The JFC should be aware of environmental requirements and their potential impact on joint operations. Environmental planning is an essential process that incorporates environmental considerations into operational planning.

For additional information on environmental considerations, refer to Chapter VI, "Environmental Considerations."

h. **Specialized Engineering Support.** In addition to the civil engineering support functions and mission areas already discussed, engineers can provide commanders with specialized engineering capabilities on a wide range of topics. Specialized engineering support capabilities are not found in all Services. The appendices provide additional details on Service-specialized engineering support capabilities. Examples of specialized engineering support capabilities are as follows:

- Port openings.
- Fire protection and crash rescue.
- Underwater construction and salvage.
- Water well drilling.
- Pipeline construction.
- Bridging.
- Runway construction and repair.
- Explosive ordnance disposal (EOD).
- Power generation.
- Specialized building construction.
- Aircraft arresting systems.
- Heating, ventilation, and air conditioning (HVAC) systems.
- Bare base systems.
- Real estate acquisition.
- Quarry operations.
- Asphalt and concrete plant operations.
- Water production.
- Pavement evaluation and analysis.
- Terrain analysis.
- Geodetic survey control.
- Countermine and counterobstacle operations.

- Support to nuclear, biological, and chemical (NBC) decontamination and recovery operations within Service limitations.

- Threat planning and basic response to incidents involving weapons of mass destruction (WMD) and HAZMATs.

i. **Technical Engineering and Contract Support.** Engineers can provide commanders with technical support on a wide range of topics. Each of the Services can provide technical engineering and contract support through various supporting organizations. As an example, the United States Army Corps of Engineers (USACE) operates the US Army Engineer Research and Development Center (ERDC), a comprehensive network of laboratories and center of expertise to include the Engineer Waterways Experiment Station, Cold Regions Research and Engineering Laboratory, Construction Engineering Research Laboratories, and the Topographic Engineering Center. The Naval Facilities Engineering Service Center provides a broad array of engineering expertise including highly specialized systems such as the offshore petroleum discharge system (OPDS) and mobile utility support equipment.

For additional information on the Services engineering support, refer to Chapter IV, "Civil Engineering Support Operations," and appendices.

Intentionally Blank

CHAPTER II
COMMAND AND CONTROL

"The battlefield is a scene of constant chaos. The winner will be the one that best controls that chaos, both his own and that of his enemy."

Napoleon Bonaparte

1. General

Joint operations can present formidable engineering challenges. **Civil engineering forces must be flexible so that the JFC can organize them in the most effective manner.** JP 3-34, *Engineer Doctrine for Joint Operations*, provides options for the organization of engineer forces and the appropriate C2 relationships. The organization of engineering forces supporting a joint operation must be based on the JFC's mission and support requirements.

2. Responsibilities

a. **The Chairman of the Joint Chiefs of Staff.** The Chairman of the Joint Chiefs of Staff (CJCS) is the principal military advisor to the President, the National Security Council, and the Secretary of Defense (SecDef). The Chairman's additional responsibilities are outlined in Department of Defense Directive (DODD) 5100.1, *Functions of the Department of the Defense and its Major Components*, and JP 0-2, *Unified Action of the Armed Forces (UNAAF)*, which includes the preparation of joint logistic plans. In conjunction with the Joint Chiefs of Staff, the Chairman normally is responsible for the following:

- Manages the development of operation planning and execution tools for the joint community.
- Reviews strategic and logistic plans to support joint operation plans (OPLANs) and recommends to the Secretary of Defense assignment of civil engineering responsibilities to the Military Services and appropriate defense agencies.
- May recommend appropriate civil engineering guidance to the Secretary of Defense for the Military Services that, if implemented, will result in civil engineering readiness consistent with approved plans.
- May advise the Secretary of Defense on critical deficiencies and strengths in civil engineering support capabilities based on the review of joint OPLANs (e.g., through the Joint Monthly Readiness Review).
- May advise the Secretary of Defense on the relative priority of competing civil engineering support requirements of the various combatant commanders (e.g., in the case of two simultaneous operations).

b. **Joint Staff Logistics Directorate (J-4).** The J-4 is responsible for reviewing logistic plans, including Civil Engineering Support Plans (CESPs) and, depending upon the nature of the operation, the coordination and monitoring of engineering operations. The J-4 advises the Chairman of the Joint Chiefs of Staff on the engineering support that can be provided for proposed courses of action (COAs).

c. **Services.** Service responsibilities are outlined in DODD 5100.1, *Functions of the Department of the Defense and its Major Components*, and JP 0-2, *Unified Action of*

the Armed Forces (UNAAF). With respect to engineering operations, the Services are responsible as follows:

- Staff, organize, train, and equip engineer resources.
- Provide input, through their Service components, to each combatant command's CESP development process regarding Service component requirements.
- Maintain the capability, through their Service component staff, to accomplish the civil engineering staff functions and responsibilities described in paragraph 2f, "Combatant Command Service Component."
- Provide personnel and logistic support required to conduct the real estate and environmental activities described in Chapter III, "Planning Considerations", and Chapter VI, "Environmental Considerations."
- Provide funding for operational requirements.
- Provide logistic and administrative support for their respective Service forces assigned or attached to joint force commands unless otherwise directed by the Secretary of Defense. Refer to paragraph 3, "Authority and Control".

d. **Commander of a Geographic Combatant Command.** During peacetime, the commander of combatant command's (CINC's) strategic planning provides the framework for employing forces in response to crisis. The CINC's civil engineering responsibilities include the following:

- Prioritizing, planning, and coordinating theater engineering support requirements.
- Evaluating component commanders' civil engineering support requirements with respect to the combatant commander's OPLANs.
- Assessing the risk of civil engineering support shortfalls on the ability to accomplish assigned missions.
- Coordinating with contract construction agents (CCAs).
- Planning the employment of component commanders' civil engineering forces and construction materials (Class IV). This includes establishing C2 relationships between the JFC and Service component engineer units.
- Establishing theater construction and real estate acquisition policies and priorities.
- Considering the tasking of a Service component to act as the executive agent responsible for civil engineering support in the operational area.
- Tasking components for theater civil engineering missions, tasks, or projects.
- Developing supporting plans and executing civil engineering support for the range of military operations.
- Reviewing component civil engineering support and construction programs for validity in support of joint OPLANs.
- Identifying and supporting civil engineering support requirements for joint operations that exceed component funding authorities.
- Considering, as appropriate, the effect of joint operations on the environment in accordance with applicable US, international, and HN laws and agreements.

- Developing the civil engineering and environmental annexes to OPLANs, campaign plans, and operation orders (OPORDs).

- Developing training and exercise programs to evaluate and improve preparedness for civil engineering missions.

e. **Combatant Command Engineer and Staff.** The combatant command's engineer and staff perform a variety of functions to synchronize civil engineering operations in the theater. The combatant command's engineer is responsible for the following:

- Prepares the CESP appendix to the logistics annex of an OPLAN and/or OPORD, which identifies the essential requirements for civil engineering operations as part of the joint operation planning process.

- Recommends an engineer task organization to be included in the task organization annex of an OPLAN and/or OPORD.

- May prepare an engineer appendix to the operations annex of an OPLAN and/or OPORD, if required.

- Prepares the environmental considerations annex of an OPLAN and/or OPORD.

- Recommends theater construction policies and priorities to the combatant commander for civil engineering missions.

- Recommends an engineer task organization to accomplish civil engineering requirements for a joint operation.

- Plans and coordinates the procurement and distribution of theater Class IV construction materiel requirements based on established priorities. (Note — Service component commands are responsible for procurement and distribution of their Class IV requirements.)

- Reviews Service component civil engineering support and construction programs for validity in support of joint OPLANs.

- Provides staff oversight for engineering functions, including the participation in joint engineering boards as required.

- Provides input to the combatant commander's peacetime theater engagement plan.

f. **Combatant Command Service Component.** In addition to or coincident with component missions specified by the combatant commander, each Service component may provide civil engineering support to the other components whose requirements exceed capabilities. Within this context, each Service component has core competencies that stem from their traditional missions and associations.

- **Army Component.** The Army has extensive real estate acquisition and troop construction support capabilities.

- **Navy Component.** Navy engineers have significant expertise in underwater, near-shore, and ship-to-shore facility construction. In support of other components, the Navy may provide the following:

  •• Civil engineering support to Marine air-ground task forces (MAGTFs)

consisting of naval construction force (NCF) units under the operational control (OPCON) of the MAGTF commander. NCF units reinforce and augment the MAGTF's limited civil engineering capability to ensure immediate and effective delivery of combat service support (CSS).

•• Military and amphibious assault construction support to joint amphibious operations and combat support (CS) and CSS ashore.

- **Air Force Component.** Air Force engineers have significant expertise in rapid deployment as well as air base activation, sustainment, force beddown, restoration activities, base denial, and rapid runway repair. The Air Force may also provide rapidly deployable engineer units organized as Prime Base Engineer Emergency Force (Prime BEEF) or Rapid Engineer Deployable Heavy Operations Repair Squadron Engineer (RED HORSE) units that can deploy either as part of an air expeditionary force (AEF) or as detached units.

- **Marine Corps Component.** Marine Corps engineers provide military and amphibious assault as well as expeditionary construction support to joint amphibious and expeditionary operations, CS, and CSS ashore.

g. **Subordinate Joint Force Commander.** A subordinate JFC plans joint operations and employs assigned and/or attached forces to accomplish assigned missions and tasks, including civil engineering requirements. **The organization the JFC establishes for engineer forces depends upon the mission to be accomplished, the capabilities and strengths of the component engineers assigned to the joint force, and the phasing of the operation.** The JFC and staff may also coordinate with other military organizations and agencies to accomplish engineering requirements for the operation.

h. **Subordinate Joint Force Engineer.** The joint force engineer serves as the principal advisor to the JFC for matters pertaining to the planning and execution of joint civil engineering support operations. The joint force engineer manages several engineering functions to include the following:

- Emergency repair of war damage to facilities and infrastructure.

- Construction and maintenance of required facilities and LOCs.

- Coordination of Class IV materiel requirements.

- Environmental management.

- Topographic support.

- Real estate management.

- Other specialized civil engineering support functions.

3. Authority and Control

JP 0-2, *Unified Action of the Armed Forces (UNAAF)*, defines the C2 relationships available to the JFC.

a. **Commander of a Combatant Command.** The CINC may exercise directive authority for logistics (or delegate directive authority for a common support capability) to include civil engineering. The exercise of directive authority for logistics by a combatant commander includes the authority to issue directives to subordinate commanders (including peacetime measures) necessary to ensure the following: effective execution of approved OPLANs; effectiveness and economy of operation; and prevention or elimination of unnecessary

duplication of facilities and overlapping of functions among the Service component commands.

- A combatant commander's directive authority does not:

  •• Discontinue Service responsibility for logistic support;

  •• Discourage coordination by consultation and agreement; or

  •• Disrupt effective procedures, efficient utilization of facilities, or organization.

- Unless otherwise directed by the Secretary of Defense, the Military Departments and Services continue to have responsibility for the logistic and administrative support of Service forces as assigned or attached to joint commands, subject to the following guidance.

  •• Under peacetime conditions, the scope of the logistic (including civil engineering) and administrative authority exercised by the combatant commander will be consistent with the peacetime limitations imposed by legislation, Department of Defense (DOD) policy or regulations, budgetary considerations, local conditions, and other specific conditions prescribed by the Secretary of Defense or the Chairman of the Joint Chiefs of Staff.

  •• Under crisis action, wartime conditions, or where critical situations make diversion of the normal logistic process necessary, the logistic and administrative authority of combatant commanders enable them to use all facilities and supplies of all forces assigned and attached to their commands as necessary for the accomplishment of their missions.

b. **Subordinate Joint Force Commander.** A subordinate JFC may exercise OPCON over assigned (and normally over attached) forces and is responsible for the employment of their capabilities to accomplish the assigned mission or objective, including civil engineering operations. The JFC organizes the joint staff to ensure an effective sharing of information among the various staff sections. Additionally, the JFC ensures that cross-Service support is provided and that all engineering forces operate as an effective, mutually supporting team. The JFC assigns civil engineering tasks to subordinate commanders.

4. Engineer Force Organizational Considerations

The JFC organizes the joint force to best accomplish the assigned mission based upon the concept of operations. The organization developed should be sufficiently flexible to meet the planned phases of the contemplated operation. **The JFC may conduct operations through Service component commanders or, at lower echelons, through Service force commanders. The JFC may establish functional component commands to conduct operations.** These functional component commands may be appropriate when forces from two or more Military Services must operate in the same dimension or medium, or to accomplish a distinct aspect of the assigned mission. Most often, however, joint forces are organized with a combination of Service and functional component commands with operational responsibilities. The JFC may also establish and conduct operations through subordinate joint forces. **The JFC's engineer organization should consider how best to achieve unity of effort, centralized planning, and decentralized execution for assigned engineer forces.** Simplicity and clarity of command relationships of the engineer organization are paramount to the effective and efficient use

of engineer forces due to the varied nature of engineer tasks, units, and capabilities.

For additional information on joint command relationships, refer to JP 0-2, Unified Action Armed Forces (UNAAF).

5. Command and Control Options

The JFC should organize the joint force to most effectively use available resources. Each Service's engineer forces are adaptable and can be tailored to meet mission requirements. The C2 options presented in this section are designed to take advantage of this flexibility. In addition, the command relationships that are developed initially may change as the operation matures in order to meet civil engineering requirements within the operational area.

a. **Service Component Command. Service component commanders maintain OPCON over their Service engineer forces under this organizational option** (see Figure II-1). The advantage of this arrangement is that it maintains traditional command relationships and is best used when the JFC chooses to conduct operations through Service component commanders and engineer forces are used in direct support of Service component missions. For example, Navy engineer forces may be attached OPCON to the Marine component commander for civil engineering support. **A Service component command may be delegated tactical control (TACON) of engineer forces from another Service in order to accomplish the assigned mission or tasks.** In addition, the JFC may establish support relationships between subordinate commanders to aid, protect, complement, or sustain another force.

b. **Functional Component Command.** The JFC may also organize to accomplish the mission using one or more functional component commands (see Figure II-2). **Under this organizational option, the JFC establishes command relationships for**

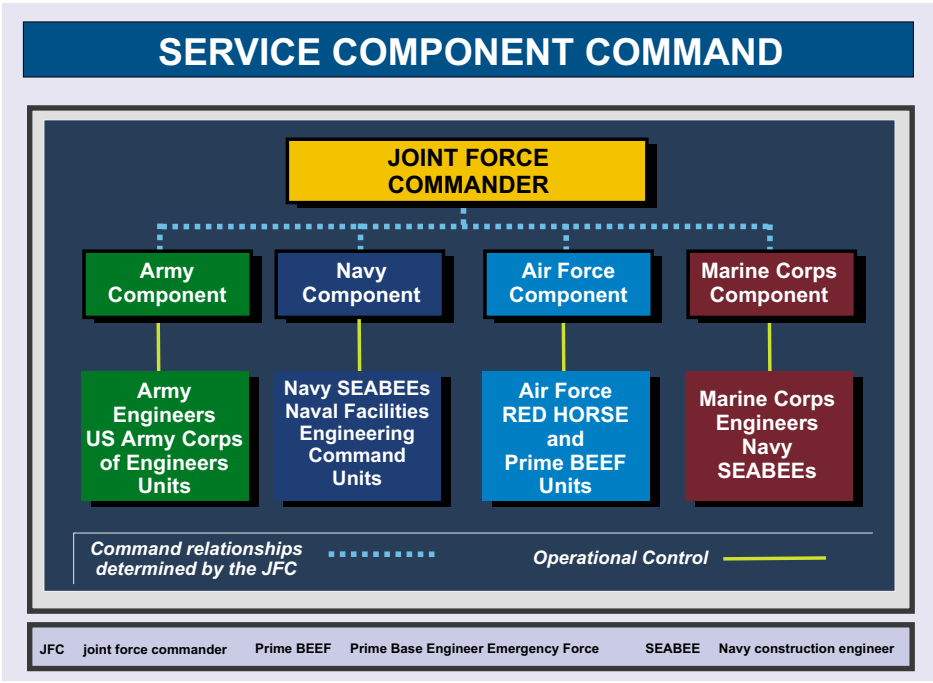


Figure II-1. Service Component Command

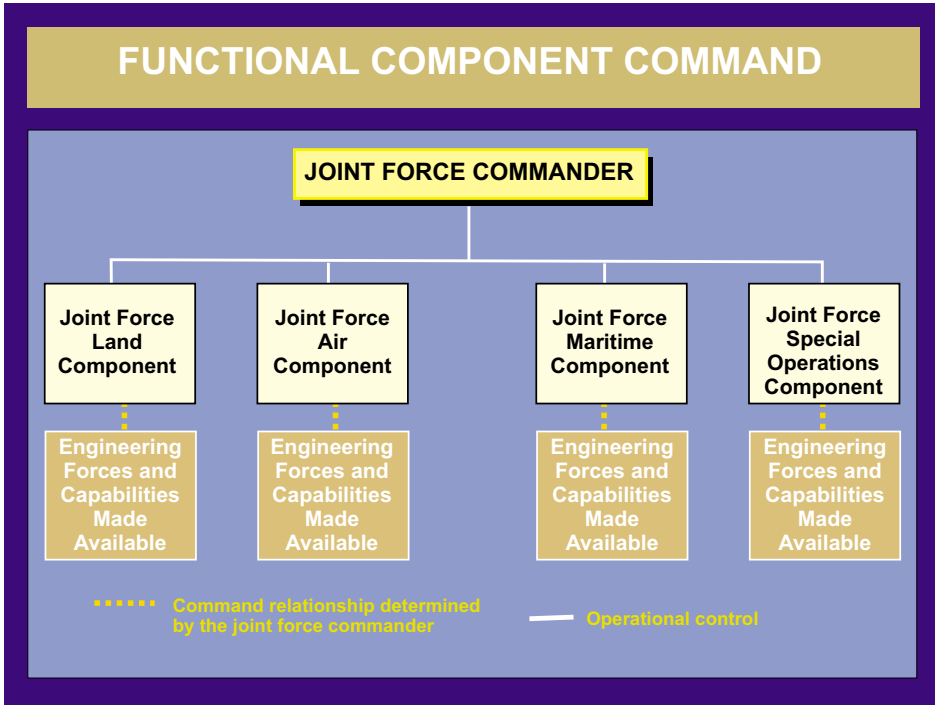


Figure II-2. Functional Component Command

engineer forces based on the requirement for engineer missions. The JFC is responsible for establishing the appropriate relationships between components to accomplish the required tasks. For example, Air Force or Navy engineers may be attached TACON to the joint force land component commander. In this case, engineer units may be controlled by a component other than their own Service and respond directly to the supported component's requirements. Use of civil engineering forces either in direct support or attached to a functional component commander is a viable option when providing capabilities tied directly to the functional component's mission. The functional component command will not normally be responsible for providing common logistic support (e.g., beddown construction) to the joint force. When the joint force air component commander (JFACC) does not have engineer forces assigned, the JFACC will coordinate with the JFC to obtain this support from the other component forces. Similarly, when the joint force special operations component commander (JFSOCC) does not have engineer forces assigned, the JFSOCC will also coordinate civil engineering support requirements through the JFC to obtain this support from other components of the joint task force (JTF). There are numerous variations in organizing engineer forces under this command structure that provides significant flexibility to the joint force. The key advantage of this organizational option is that it provides the JFC with the ability to tailor the engineer capabilities within the operational area by crossing Service component lines to best achieve mission requirements.

c. **Subordinate Joint Task Force.** Some joint force operations are extremely engineer-intensive, requiring numerous engineer assets to complete a multitude of tasks required to accomplish the mission. To consolidate requirements and better orchestrate forces, **the JFC may opt to establish a subordinate JTF**

to control extensive engineer operations and missions. This option provides a coordinated approach to address engineer responsibilities. The JFC designates the military engineer capabilities that will be made available for tasking and the appropriate command relationships. The subordinate JTF commander could be granted OPCON, TACON, or a support relationship over engineering capabilities made available for tasking depending on the degree of control that the JFC desires to delegate. The engineer assets attached to the subordinate JTF will normally be made up of engineer assets from the various Services. If the subordinate JTF is to provide a common support capability, it will require a specific delegation of directive authority from the combatant commander for the common support capability that is to be provided.

d. **Command, Control, Communications, and Computers (C4) Support for Engineer Forces.** How engineer forces will be supported with C4 systems for effective C2 is an essential consideration for the JFC and the joint force engineer. Engineer forces have organic C4 capabilities within Service channels up to their component headquarters. When operating in a joint environment, engineer units retain their organic C4 capabilities, but may also require additional support from their Service component, other Service components or the joint force C4 Systems Directorate. **Specific C4 requirements will depend on the C2 arrangement of the engineer forces within the joint force, mission tasking, and geographic location in the operational area.** The following description of capabilities may be helpful in developing the C4 concept for engineer forces supporting the joint force.

- **Air Force engineer forces' C4 requirements beyond unit level capability are provided by deployed installation communications elements.** These communications elements are embedded in the base information infrastructure (BII). Developed as part of the Air Forces Expeditionary Aerospace Force concept, BII packages are scalable, modular communications support packages that offer deployed personnel access to such standard services as secure and unsecure telephones and facsimiles, Non-Secure Internet Protocol Router Network (NIPRNET) and/or SECRET Internet Protocol Router Network (SIPRNET), and land mobile radio repeaters. When operating out of an Air Force, joint, or combined operations center, Air Force engineer forces can gain access to a wide range of mission support systems. These systems provide linkage to the Global Command and Control System (GCCS), Joint Operation Planning and Execution System (JOPES), and other intelligence, surveillance, and reconnaissance systems necessary for mission planning and operations.

- **Army engineers use the Global Command and Control System-Army (GCCS-A) at the corps level and above, and the Army Battle Command System (ABCS) at the corps level and below.** The Maneuver Control System, a sub-function of the ABCS, is used down to the divisional battalion level to accomplish C2. At the brigade level and below, Army engineers rely on organic communication assets that include encrypted frequency modulation, satellite, facsimile, phone, and digitized tactical e-mail. When operating in a joint force, Army engineers rely on organic communications capability. The GCCS-A affords engineers access to JOPES and provide the ability to communicate with the JFC's headquarters and other elements of the joint force.

- **NCF engineers have sufficient capability to perform all internal C4 operations and**

to communicate with subordinate, adjacent, and higher headquarters. Naval construction regiments can maintain voice communications with subordinate units and higher authority by telephone, very high frequency (VHF), high frequency (HF), and limited ultrahigh frequency (UHF). They can transmit data and achieve limited NIPRNET and SIPRNET access via UHF or satellite phone. Battalion level units have internal client and/or server tactical data network computer systems and can transmit information and achieve limited NIPRNET and SIPRNET connectivity via UHF or satellite phone. When operating in a joint force, NCF engineers rely on organic communications capability, but may also require additional support.

- **Marine Corps engineers have sufficient capability to perform all internal C4 operations and to communicate with subordinate, adjacent, and higher headquarters at the division level and below.** Marine Corps engineer units can maintain voice communications with subordinate units and higher authority by secure telephone, VHF, HF, and limited UHF. They can transmit data and achieve limited NIPRNET and SIPRNET access via UHF satellite communications. Marine Corps engineers have access to the GCCS at the Marine expeditionary force (MEF) level and above. When operating in a joint force, Marine Corps engineers rely on organic communications capability, but may also require additional support.

6. Engineer Staff Organizational Considerations

a. **Placement Within the Joint Force Structure.** The combatant commander and subordinate JFC will organize their staffs to carry out their respective assigned duties and responsibilities. When engineer or other requirements exceed the staff's capability (qualified personnel, facilities, and equipment) assistance may be requested through higher headquarters. **Based on mission-specific requirements, the engineers may be placed within the Operations Directorate (J-3), J-4, or organized as a special staff to the JFC.** In handling topographic engineering requirements, the JFC may choose to organize topographic engineers within the Intelligence Directorate (J-2). Regardless of the option or combination of options utilized, the requirement for the staff engineer remains, as well as the need for constant communication, liaison, and coordination throughout the entire staff. Within each of the following three options, the JFC may establish a contingency engineering management organization when extensive coordination and project management is needed. **When established, the contingency engineering management organization is led by the combatant command or subordinate joint force engineer and coordinates daily operations to ensure the delivery of engineering services to the joint force.** The contingency engineering management organization also functions as a clearing house for engineering plans, reports, and external coordination. The contingency engineering management organization directly interfaces with component engineer staffs and the JFC.

- **Operations Directorate Staff.** When engineer efforts predominantly support operational movement, maneuver and force protection, the JFC should consider placing the engineer staff as a cell within the J-3 to coordinate requirements for mobility, countermobility, and survivability within the operational area. This option will provide the fastest exchange of information during crisis action planning (CAP), and optimize the use of supporting capabilities.

- **Logistics Directorate Staff.** When engineer efforts predominantly support logistic operations, the JFC should consider placing the engineer staff or cell as an element within the J-4. This option facilitates the planning and coordination among engineers and logisticians for the construction and repair of LOCs, MSRs, airfields, and other logistic facilities.

- **Engineer Special Staff.** When the engineer effort is a significant focus or a key element of the joint operation, or where the engineer effort is equally divided between CS and CSS operations, the JFC should consider establishing an engineer special staff element that reports directly to the JFC. This option provides the greatest flexibility in orchestrating diverse engineer operations and it provides the greatest visibility of engineer capabilities, requirements, and responsibilities throughout the staff.

b. **Functions**

- **Planning.** Engineers should be actively involved in the early phases of CAP and deliberate planning processes. Early engineer involvement in the planning process ensures the following:

  •• The battlespace is shaped to support joint operations.

  •• The required infrastructure is created and/or reinforced to support joint operations.

  •• The required specialized topographic products are produced to conduct detailed planning and operations.

- **Operations.** Civil engineering tasks in support of joint operations span the full width and depth of the operational area. The engineer staff's functions during joint operations are critical to the successful accomplishment of the mission. A detailed discussion on the engineer staff's role during operations with respect to civil engineering functions is presented in Chapter IV, "Civil Engineering Support Operations."

c. **Contingency Engineering Management Organizations.** Experiences in recent contingency operations have emphasized the

Air Force engineers plan layout of a tent camp to support force beddown.

importance of timely planning and preparation in providing essential engineer support requirements to the joint force. Combatant command and subordinate joint force engineer organizations should be tailored and trained in peacetime for operations across the range of military operations. **The combatant commander or subordinate JFC may form a contingency engineering management organization as an option to augment the joint force staff with additional Service engineering expertise to support both deliberate planning and CAP and provide construction management in contingency and wartime operations.** The combatant commander may form a theater contingency engineering management (TCEM) cell and similar organizations may be formed at subordinate levels of command, (e.g., regional contingency engineering management (RCEM) cell and/or joint task force contingency engineering management (JTFCEM) cell). **These contingency engineering management organizations should be staffed with expertise across the three engineer battlespace functions; combat engineering, general engineering, and topographic engineering.** Service component engineer personnel should be assigned to these contingency engineering management organizations to facilitate coordination. The TCEM, RCEM, and JTFCEM organizations support OPLAN and CESP development and the management of contingency engineering operations. These organizations provide additional engineering capability to include planning, construction management, regional or country expertise, or specific technical support. Service components with operational forces supporting a contingency operation may provide liaison officers to the TCEM and/or RCEM organizations to enhance coordination. The TCEM and RCEM organizations can assist in plan development during peacetime and in the management of contingencies by completing the following:

- Analyzing the combatant commander's or subordinate JFC's intentions for joint operations across the range of military operations and formulating a construction program based on the commander's priorities.
- Identifying potential shortfalls in construction capabilities, assessing associated risks, and developing related options.
- Developing construction policies, including construction standards, project approval procedures, recommendations for resource allocation, and reporting requirements.
- Reviewing and monitoring HNS agreements as they pertain to the civil engineering effort. This includes tracking HN construction, infrastructure, and facility support capabilities and the status of projects accomplished by HN forces or agencies.
- Monitoring and recommending the use of construction assets based on operational requirements and tasking for civil engineering assets.
- Monitoring the operational status of engineering forces and influencing engineering, construction, and logistic support issues for those forces.
- Monitoring and influencing the management of funds for the construction effort.
- Advising on environmental management requirements.

7. Establishment of a Joint Task Force

a. **General.** The delegation of functions from the combatant commander to the subordinate JFC is a time-sensitive requirement that is critical to the success of joint operations. The JFC should have the benefit of any deliberate planning conducted by the combatant commander and staff for the conduct of the mission. The requisite information and expertise contained in the combatant commander's staff should be embedded within the JTF staff as early as possible so that the JFC can plan and execute mission requirements, including civil engineering support operations that will serve to shape the battlespace.

b. **Crisis Action Planning and the Joint Planning Group.** When CAP is initiated for an operation, effective interaction between the combatant command and the JTF staff is essential to optimize information flow and coordinate planning activities. Optimally, a JTF should be established before or during Phase III, COA Development, of the CAP process. **To enhance the planning process, the JFC may form a joint planning group (JPG) that will contain members of the combatant commander's staff as well as members of the JTF staff.** Engineer participation is essential at each level to enhance the interaction between headquarters and prevent duplication of effort.

For additional information on the CAP process, refer to JP 5-00.2, Joint Task Force Planning Guidance and Procedures.

c. **The Deployable JTF Augmentation Cell.** At the core of the JPG is the planning cell, which can vary in size and staff section representation. This planning cell may form an operations planning team, with engineer participation as required, to enhance the planning activities of the JTF engineer staff. The deployable JTF augmentation cell (DJTFAC) serves several purposes that are critical to the timely and efficient transfer of functions between the combatant command staff and the JTF. As the full JTF staff is formed and becomes operational, the combatant commander's staff, through the DJTFAC, may transfer applicable functions to the JTF staff that are necessary for fulfillment of operational requirements. The DJTFAC performs the following:

- Assists in initiating the JTF planning process by ensuring that the appropriate expertise is embedded within the JTF staff during CAP.
- Provides continuity of effort between the combatant command staff and JTF staff.
- Serves as a focal point to train the JTF staff as needed for mission requirements.
- Provides engineer planning and execution support.

8. Engineer Boards

Joint force operations can be extremely engineer intensive, requiring the coordination of numerous engineer assets performing a multitude of tasks, many of which are urgently needed for mission accomplishment. **A combatant commander or subordinate JFC may establish boards to manage engineer activities and ensure an effective use of resources.** These boards allow concerns to be raised and considered before policies are implemented. If appropriate, the combatant command or subordinate joint force J-4, or joint force engineer may convene these engineer boards before deployment to establish standards and provide guidance to components for their mission-analysis and deployment preparations. Convening the boards before deployment may not always be possible, because of the rapid manner in which the joint force staff may be assembled and deployed; however, the nature of these boards

dictates they be assembled at the earliest possible time.

a. **Joint Facilities Utilization Board.** The geographic combatant commander or subordinate JFC may establish a Joint Facilities Utilization Board (JFUB) to assist in managing facilities. The JFUB is chaired by the combatant command or subordinate joint force engineer, with members from the joint staff (as required), components, and any other required special activities (e.g., legal and civil affairs). **The JFUB evaluates and reconciles component requests for real estate, use of existing facilities, inter-Service support, and construction to ensure compliance with priorities established by the Joint Civil-Military Engineering Board (JCMEB).** Most of the JFUB's work is handled by the joint force engineer with assistance from other selected board members. Unresolved issues are forwarded to the JCMEB. The JFUB also provides administrative support and functions as the executive agency for the tasking of the JCMEB.

b. **Joint Civil-Military Engineer Board.** The JCMEB is a temporary board, activated by the geographic combatant commander, chaired by the combatant command J-4 or engineer, and staffed by personnel from the components and DOD agencies or activities in support of the combatant command. **In accordance with CINC-established civil-military operations (CMO) guidelines, the JCMEB establishes policies, procedures, priorities, and the overall direction of civil-military construction and engineering requirements in the theater.** The board gauges mission impact from engineering activities and recommends actions as needed. A primary concern of the board is to deconflict requirements between the military and civilian portions of a joint operation. The JCMEB arbitrates issues referred to it by the JFUB. The JCMEB will coordinate its activities with the combatant command's engineering and CMO staff. Construction and engineering requirements that the JCMEB cannot satisfy from within the joint force resources will be elevated to the next appropriate level for support. The JCMEB also provides guidance on development of the CESP to an OPLAN and/or OPORD and, if appropriate, assumes responsibility for preparation of the CESP.

For additional information on the CESP, refer to Chapter III, "Planning Considerations," subparagraph 5.

c. **Joint Environmental Management Board.** The geographic combatant commander or subordinate JFC may establish a Joint Environmental Management Board (JEMB) to assist in managing environmental requirements. The JEMB is a temporary board, chaired by the combatant command or subordinate joint force J-4 or engineer, with members from the joint staff (as required), components, and any other required special activities (e.g., legal, medical, and civil affairs). **The board establishes policies, procedures, priorities, and the overall direction for environmental management requirements in the operational area.** The JEMB will coordinate its activities with the combatant command or subordinate joint force engineering staff. The JEMB also provides guidance on the development of Annex L, "Environmental Considerations," to an OPLAN or OPORD and, if appropriate, assumes responsibility for preparation of this annex.

For additional information on Annex L, "Environmental Considerations," refer to Chapter VI, "Environmental Considerations."

9. Interagency Organizations

Interagency organizations can greatly expand the capabilities of the joint force due to their wide range of expertise and funding resources that can be leveraged to perform functions for a given operation. This facet is

true whether the response is international in nature or is within the continental United States (CONUS). **While interagency organizations may increase the resources engaged in a given operation, they also significantly increase and complicate the coordination efforts.** Coordination and a clear understanding of the commander's intent are critical when synchronizing operational efforts involving multiple interagency organizations. The following are descriptions of some of the agencies that may be involved.

a. **Department of Defense Agencies**

- **Defense Logistics Agency (DLA).** DLA is a logistic CS agency whose primary role is to provide supplies and services to US Military Services worldwide. In addition, DLA provides contract, administrative, technical, and logistic services to the joint force. With respect to civil engineering support operations, DLA can provide the following:

  •• Manage Class IV construction materiels, including procurement, distribution, and resupply support.

  •• Manage the reuse of materials.

  •• Conduct bulk map distribution.

  •• Establish capabilities and manage the disposal of hazardous waste and personal property.

- **National Imagery and Mapping Agency (NIMA).** NIMA provides essential geospatial information and services to the JFC. With respect to civil engineering support operations, NIMA can provide the following:

  •• Digital terrain elevation data.

  •• Current geophysical conditions.

  •• Precise positioning data.

  •• Standard and nonstandard maps, charts, and specialized geospatial products.

b. **Other US Government (USG) Organizations**

- **Department of State (DOS).** The DOS is the lead agency responsible for planning and implementing the foreign policy of the United States as directed by the President. DOS is usually the first USG agency to respond to international crises, including those that may require significant civil engineering support. DOS also conducts negotiations and concludes agreements, including status-of-forces agreements (SOFAs), which can serve to facilitate the deployment and employment of the joint force, including civil engineering assets into an operational area.

- **US Agency for International Development (USAID).** USAID is the US federal government agency that implements America's foreign economic and humanitarian assistance programs. USAID is the principal US agency to extend assistance to countries trying to escape poverty, engaging in democratic reforms, and recovering from disaster.

- **Office of US Foreign Disaster Assistance (OFDA).** When disasters strike in foreign countries, the response within USAID is led by OFDA, which is part of the Bureau for Humanitarian Response. When a disaster occurs, US representatives to that country determine if there is a need and desire for US assistance. If US assistance is requested, OFDA and the US Embassy and USAID Mission in the affected country determine what OFDA assets are best suited for the specific disaster.

- **Federal Emergency Management Agency (FEMA).** FEMA is the federal government's lead agency for coordinating Federal emergency management activities within the United States and its territories and possessions. The Director of FEMA has the authority to establish policies and coordinate civil defense and civil emergency planning, management, and mitigation, including coordination of assistance from other Federal executive agencies. FEMA coordinates the activities of federal government, military, and civilian civil engineering organizations to ensure effective assistance and prevent duplication of effort. FEMA prioritizes the use of civil engineering resources.

  For additional information on FEMA, refer to JP 3-07.7, Joint Tactics, Techniques, and Procedures for Domestic Support Operations.

- **Environmental Protection Agency (EPA).** EPA has responsibilities for administration and enforcement of laws related to environmental media (air, water, and land) in the United States and its territories and possessions. After consulting the joint force staff judge advocate (SJA), the joint force engineer and staff may need to consult with the EPA regarding environmental compliance issues for operations under the purview of the EPA. Chapter VI, "Environmental Considerations," outlines specific environmental considerations and guidance for the JFC and staff when planning and conducting joint operations and exercises.

Army engineers assist in disaster relief operations such as recovery from a major ice storm. FEMA coordinates multi-Service efforts in these operations.

c. **Nongovernmental Organizations and International Organizations.** In addition to USG agencies, the joint force engineer and staff may have to coordinate civil engineering activities with NGOs and international organizations (IOs) such as the United Nations (UN). In all cases, authority must exist for direct coordination. Once coordinating authority is granted, interagency coordination is conducted through the joint force's CMOC. Interagency relationships should be established through negotiation and agreements should be in a written memoranda of understanding or terms of reference to ensure understanding and avoid confusion. Agreements may have significant legal implications on using military personnel and equipment and must be negotiated in accordance with DODD 5530.3, *International Agreements*. **NGOs may have unique engineering capabilities that can be leveraged as part of the overall operational effort.** These organizations may also require military engineer assistance to support their activities and programs in the operational area. It is critical to establish an effective engineer

liaison in the CMOC to coordinate and execute civil engineering support with these organizations.

For additional information, refer to JP 3-08, Interagency Coordination During Joint Operations, Vol. I and II, *and JP 3-57,* Joint Doctrine for Civil-Military Operations.

CHAPTER III
PLANNING CONSIDERATIONS

"Before undertaking a task the commander makes an estimate of the situation and formulates a plan of action . . . Even if when time is so short as to permit only a mental estimate, the same logical process is used."

War Instructions, US Navy, 1944

1. General

Detailed and thorough planning is essential to effective civil engineering support for successful joint operations. **OPLANs should leverage civil engineering forces and infrastructure to help shape the battlespace for the JFC.** Infrastructure directly impacts the flow of forces established in the time-phased force and deployment data (TPFDD). Accordingly, engineers should be involved in the earliest stages of the planning process to offer technical assessments of infrastructure capabilities and limitations, impacts on operations, and solutions for mitigating the limitations of infrastructure and terrain.

"A common planning process is essential. The degree to which allied commanders and staffs understand and are able to participate in planning impacts on the time required to plan and the sharing of knowledge of every component of operations."

General Robert W. RisCassi, US Army

2. Strategic and Operational Planning

At the strategic and operational levels, civil engineering operations involve the provision of facilities, infrastructure, and engineering support (e.g., leasing of port and airfield facilities, construction and expansion of APODs for offloading strategic airlift, providing repairs or improvements to SPODs, and providing power, water, and waste disposal). Thorough civil engineering support planning will provide the JFC with the most effective means to receive and sustain deploying forces.

3. Information and Intelligence Requirements

At the strategic and operational level, the joint force engineer and staff are focused on the environment and infrastructure in the operational area, and support to operational and logistic forces. **A wide variety of national and DOD intelligence organizations can provide information essential to civil engineering support planning efforts.** In addition, the joint force engineer and staff can play an effective role in the identification of intelligence requirements for operational area level data, as well as assist in the collection and assessment of that data. The joint force engineer and staff determine information requirements and submit those that concern the enemy to the joint force J-2 and those covering HNs, allies, and coalition partners to the joint force J-3 for resolution. The J-2 can provide geospatial information compiled by NIMA. In addition, the topographic engineers within the Army component can provide special topographic engineer-derived products assessing terrain support for mobility and countermobility operations. The topographic engineer products are also extremely useful in the engineer planning process as a means of identification and feasibility determination for beddown and staging areas, possible resource (gravel, sand, etc.) locations, and LOC capability.

a. **Joint Intelligence Preparation of the Battlespace and Intelligence Preparation of the Battlespace Products.** Engineer participation in both the joint intelligence preparation of the battlespace and the intelligence preparation of the battlespace processes **improves the JFC's and component commander's campaign planning by identifying the most effective use of terrain and infrastructure for the conduct of successful operations**. After analyzing the mission, the joint force engineer and staff develop engineer priority intelligence requirements (PIRs) and information requirements (IRs). At the operational level, this includes the following detailed engineer information.

- Geology.
- Hydrology.
- Weather or effects of weather on terrain, mobility of joint forces, and engineering activities.
- Hydrography.
- Infrastructure.
- Availability of construction resources in the HN and region.
- Environmental and hazardous conditions.
- HN, allied, and coalition partner military engineering capabilities.
- Local and regional contractor capabilities, and potential impact on the local economy.

b. **Civil Engineer Unique Priority Information Requirements.** Many of these PIRs can be satisfied by information available in national-level DOD intelligence databases. **Civil engineering operations may require additional data and information beyond that required by other staff planners.** The civil engineer unique PIRs support both staff planning and engineer mission execution. The following are civil engineering PIRs.

- **Geology.** Civil engineers require knowledge of the surface and subsurface strata for foundation designs (where required) and selection of anchoring systems.
- **Hydrology.** Civil engineering support planning and design require site surveys of the hydrologic characteristics of the operational area as critical considerations in the placement of logistic base complexes and base camps.
- **Hydrography.** Hydrographic conditions in the near shore and surf zones of shore areas impact the selection of sites for amphibious assault, assault follow-on, MPF, and JLOTS operations.
- **Climate.** Temperature, wind velocity, and precipitation have a significant impact on terrain and bodies of water. The impacts of weather can limit the progress of civil engineering operations and project execution. Certain types of civil engineering work are especially impacted by adverse weather (e.g., earthmoving operations can become severely restricted by saturated soil conditions).
- **Infrastructure.** Essential civil engineering information on infrastructure (e.g., facilities, airfield data, utilities systems, and transportation structures) includes HN design, construction, and maintenance practices as well as overall condition assessment (particularly of roads, bridges, ports, and airfields).
- **Availability of Construction Resources** (locally available contractors, skilled labor, construction equipment, and

construction materials) **in the HN and Region.** Class IV construction materials may be acquired anywhere in the world; however, not all construction material is of adequate quality and quantity to meet mission needs. Adoption of local building design practices and use of local materials often provide facilities that meet mission needs while reducing costs and demands on logistic support systems.

- **Effect on HN Economy.** Significant civil engineering operations can have an impact on the HN economy. As the United States increases its reliance on contracting for logistic support, more is demanded from the HN and regional economies. The JFC should closely manage the US military demands on the local economy(s) so that the local economy maintains the minimum capabilities (e.g., skilled personnel, materials, and equipment) needed to sustain the HN's own requirements.

- **Environmental Information.** Environmental characteristics may effect the JFC's COA and should be considered in the planning process. These characteristics include, but are not limited to; cultural and historical resources; flora and fauna; and natural resources such as coal, oil, clean air and water supplies, and arable land. Institutional information (e.g., environmental procedures and standards expressed in treaties, conventions, SOFAs, and HN laws and/or standards) is also critical to operation management.

- **The Environmental Hazards of the Battlefield.** These hazards are also an important characteristic that should be considered. Environmental hazards are conditions that have the potential for polluting the air, soil, or water; for degrading natural or cultural resources; or for causing risk to human health and safety. For example, during Operations DESERT SHIELD and DESERT STORM, environmental hazards and public health became issues due to oil well fires and massive amounts of diesel fuel and crude oil that were dumped on roads for dust control.

c. **Engineer Information Collection. Engineer organizations may also be considered sources of intelligence information to satisfy the combatant commander's or subordinate JFC's PIRs and IRs.** As the result of operational area engagement activities over the years, the combatant command, subordinate joint force engineer, and Service engineer organizations (e.g., USACE and the Naval Facilities Engineering Command [NAVFACENGCOM]) have acquired vital engineering data and information, not otherwise available from traditional intelligence resources. Civil engineers can also make important contributions to the intelligence information collection effort by conducting on-site reconnaissance and discussions with local officials. Civil engineers can determine if the local infrastructure can support military operations.

d. **Engineer Assessment of Intelligence.** As data and information are collected, the joint force engineer can contribute to the assessment of that information. Additionally, the joint force engineer can support the development of special products and studies. The engineer assessment process serves the following purposes:

- Contributes to the JFC's development of COAs.

- Allows the joint force engineer and staff to consider potential battlespace support for anticipated engineering missions.

- Leads to refinement of the engineer force list.

4. Civil Engineering Support Planning Considerations

a. **Mission.** The mission statement serves as the impetus for the detailed planning process. It is the JFC's expression of what the joint force must accomplish and why. All civil engineering support planning focuses on supporting the JFC's mission statement.

b. **Commander's Intent.** The commander's intent describes the JFC's desired end state and is a concise expression of the purpose for the operation. A clear understanding of the commander's intent provides the joint force engineer and staff with the framework to participate in the development of viable COAs.

c. **Concept of Operations.** The concept of the operations describes how the JFC visualizes the operations will unfold based upon the COA selected in the planning process. The JFC will identify how the components of the force will work together to accomplish the mission. In engineer-intensive operations, this description should include the organization and C2 arrangements for engineer forces.

d. **Logistics.** The JFC's concept of logistics is a key part of the synchronization of joint operations. **The civil engineering support planning effort focuses on facilities that will support the mobilization, deployment, employment, sustainment, and redeployment of the joint force.** During a contingency, the combatant command or subordinate joint force engineer may be required to plan for new construction or improve existing infrastructure to facilitate deployment of forces. Since civil engineering support operations are often unique and situation specific, logistic and civil engineering support planning must be conducted in concert with each other in order to accurately forecast requirements (e.g., Class IV construction materiel requirements). Logistic requirements, including civil engineering support, will affect the flow of forces into the operational area by necessitating the early deployment of support units to enlarge the force reception throughput.

> *"For want of a nail, the shoe was lost;*
> *For want of a shoe, the horse was lost;*
> *For want of a horse, the rider was lost;*
> *For want of a rider, the battle was lost."*
>
> **Benjamin Franklin**

e. **Contingency Construction Funding.** Adequate funding must be available to undertake the acquisition of facilities to meet the joint force requirements, whether by construction or leasing. **Funding constraints are a planning consideration.** The JFC articulates funding requirements for construction and leasing of facilities by considering the missions supported and the amount of funds required. The JFC should take steps to assure that the Service components allocate sufficient funds for facility construction, including associated contract administration services and real estate acquisition and disposal services. Facility construction planning must be routinely and repetitively accomplished to ensure that mission-essential facilities are identified well in advance of the need and, wherever possible, on-the-shelf designs are completed to expedite facility construction in time of need.

For additional information on contingency construction funding, refer to Appendix F, "Contingency Authorities and Funding."

> *"Planning is everything — Plans are nothing."*
>
> **Field Marshall Helmuth Graf von Moltke**

5. Civil Engineering Support Planning

Civil engineering support planning is the process used to provide integrated civil

engineering support for joint operations. The process includes a determination of the requirements for civil engineering support and analysis of the available facilities to fulfill those requirements. Requirements for civil engineering support will be based on the combatant commander's or subordinate JFC's concept of operations.

a. **Requirements for civil engineering support.** The requirements should reflect the civil engineering support necessary for the expected duration and intensity of operations, be limited to the forces employed, and time-phased.

- **Facilities are grouped into six broad categories that emphasize the use of existing assets over new construction.** To the maximum extent possible, facility requirements should be met from these categories in the following priority order:

  •• US-owned, occupied, or leased facilities;

  •• US-owned facility substitutes pre-positioned in theater;

  •• HN, allied, and coalition support where an arrangement exists for the HN, allied, or coalition nation to provide specific types and quantities of facilities at specified times in designated locations;

  •• Facilities available from commercial sources;

  •• US-owned facility substitutes stored in CONUS (e.g., HARVEST EAGLE and HARVEST FALCON); and

  •• Construction of facilities that are considered shortfalls after an assessment of the availability of existing assets.

- In general, the combatant command or subordinate joint force engineer should plan expeditious construction of facility requirements that are considered shortfalls (i.e., those facilities that cannot be sourced from existing assets). In these circumstances, **the appropriate Service, HN, alliance, or coalition should to the extent possible perform construction during peacetime**. Contracting support should be used to augment military capabilities. Because construction is time consuming and entails the risk of not being finished in time to meet mission requirements, the combatant command and subordinate joint force engineer should seek alternative solutions to new construction. **Expedient construction (e.g., rapid construction techniques such as pre-fabricated buildings, clamshell structures, etc.) should also be considered,** as these methods can be selectively employed with minimum time, cost, and risk in offering in-theater forces another source of required temporary facilities.

"In war nothing is achieved except by calculation. Everything that is not soundly planned in its details yields no result."

Napoleon Bonaparte

b. **Civil Engineering Support Plan.** The combatant command engineer and staff prepare a CESP of an OPLAN as part of JOPES deliberate planning process. **Development of the CESP ensures that essential civil engineering capabilities are identified and will be provided at the required locations and at the appropriate times** to support the mobilization, deployment, employment, sustainment, and redeployment of the joint force in support of joint operations. The CESP establishes theater-level requirements for facilities, facility support, projected construction, Class IV (construction materiel), and civil engineering capability in support of deployed US forces. The culmination of sound civil

engineering support planning is the development of a comprehensive CESP that identifies essential civil engineering support required for joint operations of an OPLAN.

- The CESP should identify the overall facility requirements and summarize the existing US assets, HNS, allied and coalition assets, and construction needed to satisfy those requirements. It should include the requirements for HN, contract, allied, coalition, and US civil engineering forces and identify the civil engineering capability available for accomplishing construction as well as essential combat engineering, emergency war damage repairs, maintenance of LOCs and MSRs, troop beddown construction, weapons storage and maintenance facilities, construction support to force protection, acquisition of construction and engineering support, and contract, HN, allied, and coalition support. The CESP should summarize shortfalls in terms of unsatisfied requirements.

- The Joint Engineer Planning and Execution System is a tool used to support the combatant command engineer and staff in development of the quantitative aspects of civil engineering support planning and provides the general requirements for the CESP appendix to an OPLAN.

c. **Civil Engineering Support Planning in Crisis Action Planning.** The information in the OPLAN CESP may also be used by the combatant command or subordinate joint force engineer as a basis for preparing a CESP for an OPORD as part of the CAP process. OPLANs, strategic plans, planning documents, and available resources are considered to facilitate preparation of the CESP in CAP.

For additional information on CESP, refer to Appendix 6 to Annex D of Chairman of the Joint Chiefs of Staff Manual (CJCSM) 3122.03A, Joint Operation Planning and Execution System Vol II: (Planning Formats and Guidance).

d. **Civil Engineering Mission Analysis and Staff Estimate Process.** When the JTF receives a planning directive (e.g., CINC's warning order and/or planning order) the planning element, usually the JPG and other staff such as the engineers, conduct an

The civil engineer planner should identify specialized unit requirements, such as water well drilling teams, early in the advanced base development process.

operational mission analysis and brief the commander, joint task force (CJTF). **The purpose of the mission analysis is to understand the strategic and operational situations, CINC's intent and concept, and develop essential tasks and a clear JTF mission statement.** After the mission analysis brief to the CJTF, planning guidance is given so the JPG and staff can begin COA development, followed by COA analysis and COA comparisons. **Next, a COA decision brief is presented to the CJTF and a COA is selected upon which plans and orders are developed.** As part of the staff, engineers must conduct their own parallel planning and analysis and prepare the engineer staff estimates to ensure that the engineer effort will support the CJTF concept of operations. The engineer staff estimate process is built on 10 steps and is illustrated in Figure III-1.

It is of paramount importance that the entire staff, including engineers, is involved in mission analysis through their representatives to the JPG.

e. **Advanced Base Development Plan.** The advanced base development plan **describes the infrastructure required to support the deploying force**. This description includes a listing of the existing facilities, roadways, airfields, and utilities within the operational area as well as a projection of infrastructure that must be constructed to support the operation. All construction and facility modification requirements should be prioritized within the plan. The plan must identify any real estate required to support new construction; the list of real estate needs should be coordinated with the HN whenever possible. In CAP, the advanced base development plan results from concurrent planning by the joint force engineer and staff and Service component engineer staffs (see Figure III-2).

f. **Required Engineering Capabilities.** The CESP must assess the engineering requirements dictated by the mission tasking. **It should include consideration of the apportionment and allocation of engineering forces under existing plans, TPFDD, and Service specific capabilities.** Engineer units are generally assigned projects needed to meet early mission requirements or located in more hazardous, high threat areas within the operational area. As the situation stabilizes, contractors may assume a larger role in civil engineering support to the joint force.

g. **Construction Assets.** The joint force engineer coordinates with the Service component engineers to ensure that construction capability is available to support the joint force. **Key construction assets include military engineers, civilian engineers, and contractors.** While all of these assets are capable of executing similar projects, they are not necessarily interchangeable. The civil engineering planner should consider the strengths, capabilities, and availability of each when planning civil engineering operations. Specialized unit requirements such as water well-drilling or underwater demolition and/or construction teams should be identified early in the advanced base development process.

For additional information on Service-specific capabilities, refer to Appendices A through D.

h. **Construction Materials.** Civil engineering planners must understand the commander's intent and concept of operations, including expected duration of operations, in order to ensure appropriate material selection. **Materials not locally available must be purchased and shipped to the operational area.** To support these shipments, adequate port facilities must be available early for reception of equipment and materials required for execution of the plan. If adequate facilities are not available or

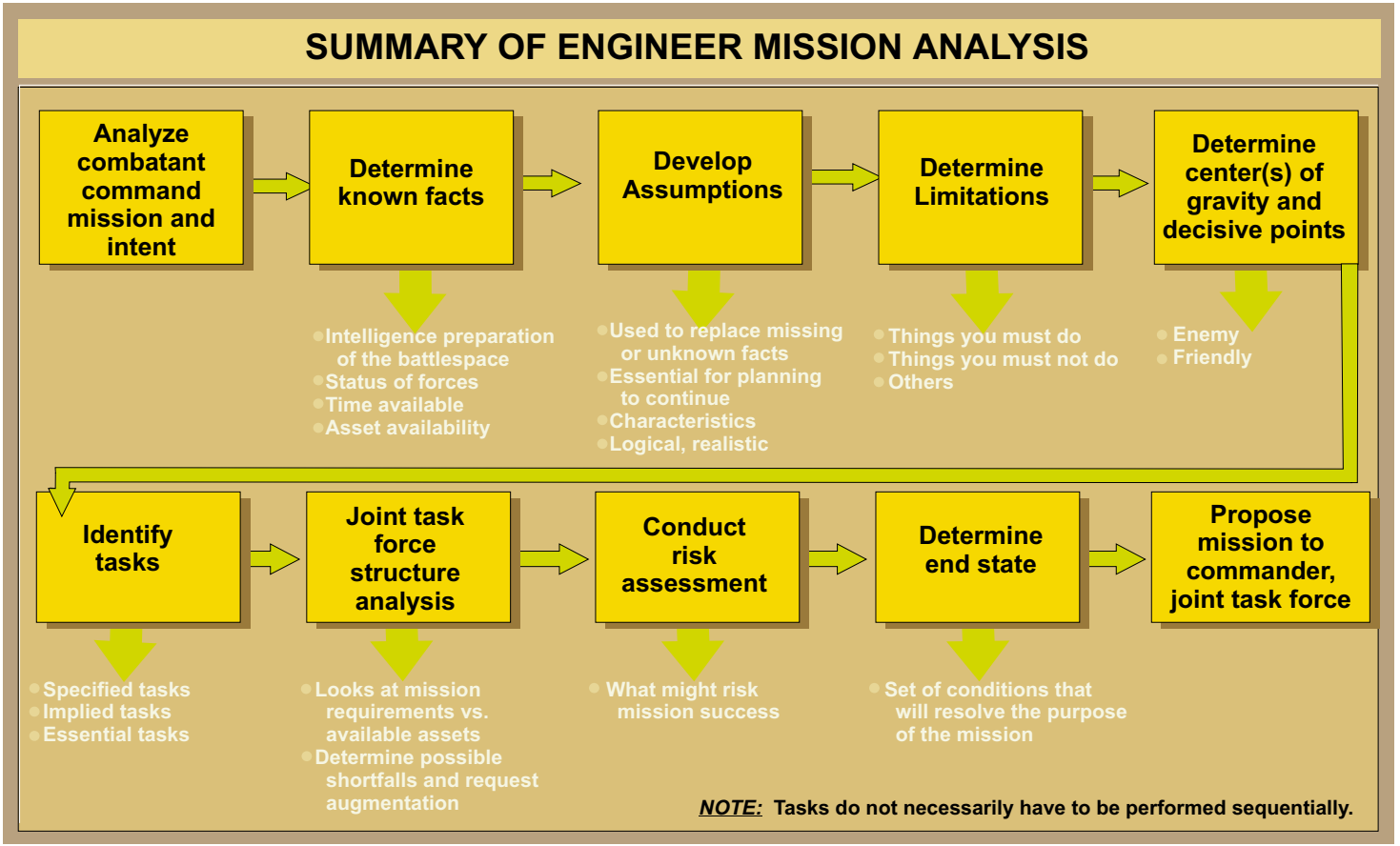


Figure III-1. Summary of Engineer Mission Analysis

Figure III-2. Facility Requirements Factors

existing facilities cannot be adapted or modified, it may be necessary to establish sites for JLOTS operations. It is crucial that the engineering requirements and requisite construction materials be identified early and requisitions be initiated prior to deployment. Due to long lead time, it may take several months for certain materials to arrive in the operational area. For this reason, **initial construction material forecasts based on the CESP are usually submitted by the Service components** using various systems, including CESP data and advanced base development data. Considerations include the following:

- **Quality of Material.** Contingency construction may not require the standards of peacetime construction projects; however, the finished facilities must be constructed to the standards established for the operation. Use of local building materials and techniques minimizes shipping of materials and produces structures that are best suited to the local environment.

- **Quantity of Material.** The CESP gives an order of magnitude for the quantities of materials required to support the operation. Because operational

requirements may change after the materials have been ordered and shipped, civil engineers should consider materials and building systems that can be adapted for other uses.

- **Cost.** The cost of construction materials is highly visible to the JFC. Whether built by military civil engineering forces or contractors, procurement of materials is funded by the Service components for support to joint operations. The civil engineer planner must consider the impact of limited funding on the overall priority of projects to meet essential facility requirements of the joint force.

i. **Construction Standards. The combatant commander specifies the construction standards for facilities in the theater.** The standards are established to ensure that projects support the commander's intent and concept of operations. The standards are intended to minimize the engineer effort expended on any given facility while assuring that the facilities promote sufficient quality for personnel health and safety and mission accomplishment. The OPLAN or OPORD should also address construction standards for the operation. Where the mission requirements are similar, facilities should be constructed to the same standards by all Services. Construction standards are detailed in Figure III-3.

j. **Real Property Requirements.** A fundamental mission of engineers in the operational area is to provide facilities through lease or construction. **In order to provide essential facilities and real estate, requirements must be carefully matched to available time and resources.** In the planning process, planners should consider the following:

- Facilities requirements.
  - •• Operational facilities (e.g., command posts, airfields).
  - •• Logistic facilities (e.g., maintenance facilities, supply points).
  - •• Force beddown facilities (e.g., dining halls, billeting, religious support facilities, hygiene).
  - •• Common use facilities (e.g., roads, JRSOI facilities).

Steel arch structures, commonly called k-spans, provide the engineer with a rapid solution to facilities requirements.

CONSTRUCTION STANDARDS IN THE THEATER

INITIAL STANDARD

- Characterized by austere facilities requiring minimal engineer effort
- Intended for immediate operational use by units upon arrival for a limited time ranging up to 6 months
- May require replacement by more substantial or durable facilities during the course of operations

TEMPORARY STANDARD

- Characterized by austere facilities requiring additional engineer effort above that required for initial standard facilities
- Intended to increase efficiency of operations for use up to 24 months
- Provides for sustained operations
- Replaces initial standard in some cases where mission requirements dictate. The temporary standard may be used initially if so directed by the combatant commander.

TYPE OF CONSTRUCTION	INITIAL	TEMPORARY
Site Work	*Clearing and grading for facilities sites including drainage, revetments of petroleum, oil, and lubricants, and ammo storage and aircraft parking; aggregate for heavily used hardstands; and soil stabilization*	*Engineered site preparation, including paved surfaces for vehicle traffic areas and aircraft parking, building foundations, and concrete floor slabs*
Troop housing	*Tents (may have wood frames and flooring)*	*Wood frame structures, relocateable structures, and modular building systems*
Electricity	*Tactical generators: high and low voltage distribution*	*Nontactical or commercial power and high or low voltage distribution*
Water	*Water points, wells, and/or other potable water production and pressurized water distribution systems*	*Limited distribution to hospitals, dining halls, and other large users*
Cold storage	*Portable refrigeration with freezer units for medical, food, and maintenance storage*	*Refrigeration installed in temporary structures*
Sanitation	*Organic equipment, evaporative ponds, pit or burnout latrines, lagoons for hospitals, and sewage lift stations*	*Waterborne to austere treatment facility - priorities are hospitals, dining halls, bathhouses, decontamination sites, and other high volume users*
*Airfield pavement**	*Tactical surfacing, including matting, aggregate, soil stabilization, and concrete pads*	*Conventional pavements*
Fuel storage	*Bladders*	*Bladders and steel tanks*

*The type of airfield surfacing to be used will be based on soil conditions and the expected number and weight of aircraft involved in operations.

Figure III-3. Construction Standards in the Theater

- Force protection (e.g., site selection, proximity to potential threat areas, sniper screening).

- Capabilities of military engineer units and contractors.

- Required dates for construction.

- Planning considerations for the acquisition, use, and disposal of real property.

  •• Contracting for real property.

  •• Availability of HN facilities that can be assigned without cost.

  •• Availability of leased facilities from the HN.

  •• Direct US leasing of land and facilities.

  •• Real property management.

  •• Environmental conditions that may affect withdrawal costs.

- **Turn Over.** As facilities are completed and ready for use, the engineer must plan for transfer of responsibility to the facility user. Depending on the facilities, the transfer may involve a testing phase (e.g., pipelines). Also, a user may begin using the facility(s) before the construction is actually complete (termed "beneficial occupancy").

k. **Building Systems. Building systems may provide a rapid solution to facilities requirements.** The civil engineering support planner analyzes cost, availability, and timeline for execution of construction when considering the procurement and use of building systems (e.g., fabric skin, metal frame structures, steel arch structures, and panel building systems).

JOINT ENGINEERS IN BOSNIA

In order to complete all the Bosnia camps by March 1996, Brown & Root was integrated with Army engineer units, Navy SEABEEs, and Air Force RED HORSE engineers on a fast-tracked scenario. Specifically, Brown & Roots tasks were to:

- **Set up 12 camps;**
- **Provide flooring materials for the Army, Navy, and Air Force engineer units charged with setting up all other camps;**
- **Upgrade all camps to meet the Army's sustaining base standards with hard-back tents or modular buildings (in areas with the harshest conditions);**
- **Provide all basic life-support services, such as food services, laundry, water delivery, garbage collection, and shower and sanitary facilities; and**
- **Provide other logistics services, such as transportation and cargo handling, vehicle maintenance and washing, port operations, road repair and maintenance, and storage yards.**

SOURCE: LOGCAP: Providing Vital Services to Soldiers *Engineer*, March 1997

- The Services maintain and deploy a number of bare base systems (e.g., US Air Force's HARVEST EAGLE and HARVEST FALCON sets and US Army's Force PROVIDER sets) consisting of tents and fabric skin, together with metal frame structures that are rapidly assembled. These systems may require engineer support for site preparation and execution.

- Commercial building systems are also available worldwide. These systems include basic shelters (e.g., machine fabricated steel arch structures) and modular building systems complete with built-in utility wiring and utilities. While rapidly assembled and usually relocatable, they are typically more expensive than austere facilities constructed in the field.

l. **Service Standard Designs. Service standard designs should be considered for use in support of joint operations and are starting points for Service component civil engineer planners.** The designs may be modified based on operational, environmental, and unusual site conditions or unique customer requirements. Examples of Service standard designs can be found in the Theater Construction Management System for the Army and Advanced Base Functional Component System for the Navy.

m. **Construction Contract Support.** The challenge for engineer planners is to achieve the optimal mix of engineering capabilities, which may include contractor support. Some planning considerations influencing the use of contractors include the following:

- Duration, scope of work, security, and stability of the operational area.

- Availability of local resources (personnel and construction material).

- Impacts on lift and port facilities.

- Availability of funding.

- Impact on local area political and economic stabilization.

- Requirement for liaison.

- Impact of force limitations imposed by force caps that may limit the use of military engineers.

n. **Construction Contracting.** During military operations, engineer requirements will be numerous, while military engineers

OPERATIONS SUSTAIN HOPE AND NOBLE ANVIL

In Operation SUSTAIN HOPE in Fier, Albania, the JTF mission was to construct one 20,000-person camp for Kosovo refugees during the spring and summer of 1999. Called "Camp Hope," AFCAP began construction of the camp on a marshy field in early May 1999 and completed construction in 51 days on 24 June 1999. The use of AFCAP to construct this camp allowed use of the joint military engineer force for other tasking. At the conclusion of the camp construction, excess Class IV construction materials were transferred to the Army for their use in Albania. Close coordination with private organizations and nongovernmental organizations such as the Red Cross and the United Nations High Commissioner for Refugees was pivotal to the success of SUSTAIN HOPE.

VARIOUS SOURCES

will be a limited commodity. B**oth HN and US use of civilian contractors, are an effective and essential option for the JFC in order to accomplish rear area civil engineering and construction.** Civilian contractors are a powerful force multiplier, allowing military engineers to concentrate on engineering missions in high-threat areas.

- The DOD construction agents are USACE, NAVFACENGCOM, or other such approved DOD agents (See: DODD 4270.5, *Military Construction Responsibilities*). Their responsibilities include design, award, and management of construction contracts for projects associated with the peacetime military construction program. Overseas, USACE, NAVFACENGCOM, and the Air Force are assigned specific geographical areas under DODD 4270.5, *Military Construction Responsibilities*.

- The CINC may also use USACE and NAVFACENGCOM as contingency CCAs for design, award, and management of construction contracts in support of military operations. For geographical areas where there is no designated DOD construction agent, the CINC will usually designate a CCA for support in a contingency. USACE and NAVFACENGCOM also provide facilities planning, contract administration, and technical engineering support to JFCs (e.g., advanced base master planning, topographic engineering, force protection engineering, and cold-weather mobility).

- Contracting engineer support through civil augmentation programs such as the Army's LOGCAP, the Air Force's AFCAP, and the Navy's CONCAP can play a significant role in mission accomplishment. Civil augmentation contracts provide the JFC with additional options and flexibility in achieving timely engineer and logistic support.

- Regardless of the type of operation, carefully planned, supported, and executed civil engineering support using a balanced mix of engineer capabilities will enhance the success of the mission.

For additional information on construction contracting and CCAs, refer to Appendix E, "Contract Construction Agents."

6. Engineer Contribution to the Planning Process

a. **Development of the JFC's Concept of Operations.** Engineer considerations that play a role in the development of the JFCs concept of operations include the following:

- HN infrastructure capabilities.
- Allied and/or coalition support.
- Required engineer capabilities.
- JRSOI strategies.
- Facility requirements.
- Cost estimates for COAs.
- Evaluation of COAs.

b. **Detailed Plan Development.** The joint force engineer and staff review the JFC's concept of operations to determine the following:

- Facility use priorities.
- Use of CCAs in support of contingency operations.
- Estimate of required engineer capabilities.
- Estimate of funding requirements.

- Estimate of supportability.
- Civil engineering support planning requirements.

c. **Preparation of Supporting Plans.** Subordinate and supporting commands prepare detailed plans to support the JFC's concept of operations. Important requirements that should be considered for incorporating into supporting plans include, but are not limited to, the following:

- Time-phased facilities requirements.
- Time-phased construction material requirements.
- Time-phased engineer force requirements.
- Funding requirements.

d. **Post Hostilities.** Early in the planning process, civil engineering support requirements should be identified to support post hostilities. Civil engineering planning considerations for post hostilities include the following:

- Construction support to force protection operations.
- SPOD and APOD facilities maintenance.
- Repair and construction of MSRs and facilities to support future retrograde and redeployment operations.
- Termination of real estate leases and conduct close-out activities.
- Destruction of enemy materiel and ammunition (destruction should be necessary, proportional, and should not present harm to noncombatants).
- Conduct of HN infrastructure and battlefield damage assessment.
- Clearance of debris and emergency repairs to critical HN infrastructure.
- Control and removal of hazardous material and waste.
- Conduct of environmental cleanup (see Chapter VI, "Environmental Considerations").
- Reconstitution of assets.

e. **Redeployment and Transition from Military Engineers to Contractors and HNS.** In planning for redeployment operations, **the JFC should consider the priority for redeploying units**. Engineers plan for facilities to support redeployment of US forces (e.g., wash racks, vehicle and equipment holding areas, and customs inspection points). Even without follow-on missions, engineers are among the last to leave. **As engineer forces begin to redeploy, the CCA and its contractors remain in the operational area to complete civil engineering tasks.** Transition planning should be fully coordinated between the joint force engineer and staff, military engineering forces, the CCA, and the HN. Important civil engineering planning considerations include the following:

- The joint force engineer and staff should identify ongoing projects and maintenance responsibilities to be assigned to the CCA or HN for continuation and/or completion. The CCAs are experienced in using contractors to complete military engineering projects, provide facilities to support the redeployment of forces, and engage in the HN infrastructure recovery activities, as required.

- Funding requirements for projects will need to be coordinated with the CCA and HN. HN infrastructure projects may be funded by international development bank loans, foreign aid, or the HN's own funds. The CAA may provide technical assistance to the HN as part of the transition. Often the CCAs are used by USG agencies and others to oversee expenditure of funds provided for HN infrastructure projects.

- Key civil engineering planning considerations for transition of engineer tasks to the HN include:

  •• HN technical capabilities;

  •• HN ability to handle the additional workload; and

  •• HN ability to fund the work.

- Key civil engineering planning considerations for transition of engineer tasks to the CCA for contractor execution include the following:

  •• CCA management and contract funding;

  •• Security of contractor personnel;

  •• Status of contractors in the HN after US forces redeploy; and

  •• CCA relationships in the HN with respect to the CINC and the US ambassador.

7. Host Nation Considerations

There are a number of HN considerations in planning for joint and multinational operations. **Communications, interoperability of varying capabilities, and culture must be addressed.** Interpreters and advisory personnel can often facilitate interoperability, provide vital communication links among combined forces and share area expertise of HN needs and reactions to civil engineering projects. Infrastructure construction issues should be factored into the development of HN support agreements (HNSAs). The joint force engineer and staff, in coordination with the SJA or legal officer and CMO staff officer, can assist the JFC in identifying facility construction and other issues to address with the HN. These aspects are critical in terms of support to deploying forces and costs of construction to the USG (e.g., labor laws, taxes on materials, and USG contractor taxes).

a. **Duties and Taxes.** The SOFA and the HNSA should address the status of USG contractors. The Department of Defense is increasingly dependent on US contractors for support in joint operations for maintenance of equipment, logistic services, and construction of facilities. This aspect is especially important with the use of civil augmentation programs (e.g., LOGCAP, CONCAP, and AFCAP). **The SOFA and HNSA should be written to avoid import and export duties; value-added taxes on goods imported, exported, or acquired in country by or on behalf of the United States; and HN taxes on corporations should be waived.** These duties and taxes would be paid for from limited operational funds and thereby reduce support to the operations.

b. **Host Nation Labor and Materiel. Access to the HN labor, materiel, infrastructure, and services should be delineated in the HNSA.** Balance between reducing costs to the United States and hyper-inflating the local economy is an essential consideration. In consultation with the CMO officer, the joint force engineer and staff should take measures to avoid exposing HN personnel to possible HN liability, such as for environmental management.

c. **DOD Civilians and Contractor Personnel.** Just as contractor costs are an important consideration in HNSA, so is the treatment of DOD civilians and US contractor personnel in the SOFA. If the treatment of DOD civilians and US contractor personnel is not adequately addressed in the SOFA, there will be increased risk of disruption to operations. Therefore, the SOFA should address the treatment afforded to DOD civilians and US contractor personnel.

d. **Quality Control.** The joint force engineer and staff should ensure that quality control inspections are performed on contractor work. The Service whose facilities are under construction or repair should provide qualified construction quality assurance evaluators due to their experience and knowledge of the mission to be supported by that facility.

8. Use of Host Nation Government-Owned Facilities

Condition of the facilities (e.g., physical, environmental, and aesthetic) prior to use should be documented and validated by both US and HN personnel. Use of photographs and a brief narrative to record actual conditions before and after US possession is recommended. Acknowledgement of the conditions prior to use by a representative of the HN is also recommended whenever possible. This will greatly reduce disputed claims for damages by the HN. Modifications to these facilities should be kept to a minimum. Any modifications should be coordinated with and cleared by the HN prior to the beginning of any work. (Refer to DODD 2010.9, *Mutual Logistic Support Between the United States and Governments of Eligible Countries and NATO Subsidiary Bodies*).

9. Humanitarian and Civic Assistance

In humanitarian and civic assistance (HCA) facilities projects, **joint force engineer units may work with HN government agencies to repair or improve infrastructure and public facilities**. HCA programs are specifically authorized under title 10, United States Code (USC), section 401 and are

WATER, WATER EVERYWHERE

A task force construction command of eight engineer units, the advance echelon of the 5202d Engineer Construction Brigade, was organized on 1 February [1944]. . . . Their mission included installing floating bridges, clearing streets, rehabilitating and operating the municipal water and electrical systems, fighting fires, and demolishing unsafe buildings.

On 6 February, the task force moved into northern Manila with its first priority the rehabilitation of the water supply system to see the city through the remainder of the year's dry season. Fortunately, the engineers reached the reservoirs before the Japanese could destroy them. But because of battle damage and years of neglect, the water supply pipes had thousands of leaks, making them unreliable. Establishing water supply points for soldiers and civilians, even while fighting was raging in the city, the engineers and rehired water system employees were able to keep water distributed throughout the city while they repaired or replaced the pipes.

SOURCE: Barry W. Fowle, Ed.
***Builders and Fighters, the US Army Engineers in World War II,* 1992**

As part of HCA, Navy SEABEEs conduct rudimentary repairs to a road and bridge following a catastrophic flood in Honduras.

designed to provide assistance to the HN populace normally in conjunction with military exercises and operations. They are usually planned well in advance and are part of a geographic combatant commander's theater engagement plans. They are usually not in response to disasters, although HCA activities have been executed following disasters at the direction of the geographic CINC. Specific engineer activities for which HCA funds can be used include construction of rudimentary surface transportation systems; water well drilling; construction of basic sanitation facilities; and rudimentary construction and repair of public facilities. Consult servicing legal personnel for advice on the legal implications in the application of HCA.

10. Foreign Humanitarian Assistance

In support of disaster relief efforts, the UN and the DOS's OFDA in the USAID may generate requirements for DOD assistance. **FHA programs focus on the use of DOD excess property, emergency transportation support, disaster relief, or other support as necessary to alleviate urgent needs in a host country.** While all elements of the joint force are focused on providing immediate humanitarian assistance (HA) to avert the loss of life, the civil engineering contribution is focused on projects that open LOCs and provide shelter, water, and the infrastructure to support life. The joint force engineer and staff must work closely with their servicing legal office and through the CMOC with representatives of the HN and US embassy country team to formulate effective civil engineering support to the disaster relief efforts.

11. Multinational Engineering Planning Considerations

Working within an alliance or coalition may cause unique challenges for the JFC. **The joint force engineer and staff must determine what civil engineering support can be provided by other participating nations, what civil engineering support will be required from US forces by the participating nations, and what the overall facility requirements will be for the multinational force (MNF).** The following aspects are important considerations in planning civil engineering support to multinational operations.

a. **Capabilities.** The engineering capabilities of contributing **partner nations often differ based on doctrine, organization, training, leader development, equipment, history, and budget**. The joint force engineer and the engineer staff must be aware of the differences in these capabilities and consider these differences when assigning missions and conducting operations.

- Where participating forces have the capability for advanced construction, those engineering forces can be assigned major projects in support of the overall MNF. Those engineering forces will also likely be able to support their own civil engineering support requirements.

- Some allies or coalition partners may not have advanced engineering capabilities. Missions assigned to those engineering forces should be consistent with their capabilities. The joint force engineer and staff should anticipate the requirement to augment those engineering forces.

- In some cases, a participating allied or coalition force may lack an engineering capability. In those cases, the joint force engineer and engineer staff should plan to provide those forces with civil engineering capabilities as required.

b. **Integration. The basic challenge in multinational operations is the effective integration and employment of all assets toward the achievement of a common objective.** The objective can be achieved through unity of effort despite disparate capabilities, equipment, and procedures. The following aspects should be considered in the planning process.

- To reduce disparities among allied and coalition forces, engineering standards should be established and a certification process developed. These standards should include standards of materials as well as training, equipment, and procedures.

- When operating in an alliance, there are cases where international standardized agreements (ISAs) may already exist. For example, in North Atlantic Treaty Organization (NATO), the United States

KUWAITI RECONSTRUCTION

Within weeks of the Iraqi invasion of Kuwait, as US forces in Saudi Arabia reinforced Operation DESERT SHIELD, some US and Kuwaiti officials were already turning their attention to the period after Kuwait's liberation. They recognized early that careful planning would be crucial to the recovery of that nation and the restoration of its government. Although the United States had a long history of providing humanitarian assistance to other countries, this situation was unique: Kuwait had many well-educated, qualified individuals to direct the effort and the financial resources to pay for what it needed and wanted. Although US military leaders were initially reluctant to take on major responsibility for the Kuwait recovery effort, they ultimately recognized that the Department of Defense was the only agency that could provide the level of assistance that the Kuwaitis required. Army civil affairs personnel and the US Army Corps of Engineers, in particular, provided the Kuwaitis with invaluable assistance in planning the emergency response effort and helping ensure its success.

SOURCE: Janet A. McDonnell
***After Desert Storm: The US Army and the Reconstruction of Kuwait,* 1999**

is party to a number of standard NATO agreements. In addition, the United States has signed other ISAs, such as the American, British, Canadian and Australian Standardization Program (US Army), Air Standardization Coordination Committee (US Air Force), and Navy Field Z (US Navy), which require implementation as an allied common approach to conducting military engineering. These ISAs are authoritative directives for implementation by US forces and forces of other signatory nations operating as part of an alliance.

For additional information on multinational logistic operations, refer to JP 4-08, Joint Doctrine for Logistic Support of Multinational Operations.

- Standards and agreements are more difficult to establish and implement when operating within a coalition, as these are typically arranged in short timeframes for limited purposes. Usually, there is little time before deployment to establish these standards and agreements.

- Identified civil engineering shortfalls should be satisfied by either bilateral or multinational support agreements prior to the deployment of forces to the operational area. This aspect will require detailed coordination between prospective forces and the MNF.

c. **Employment.** After a determination of the civil engineering tasks required to achieve the objectives, **specific engineering tasks should be assigned to specific element(s) of the MNF based on an assessment of the capabilities of each nation's forces**. If there are several elements that can complete a particular task, consideration should be given to assigning the task in a manner that ensures that all capable elements of the MNF can make a meaningful contribution to the desired end state.

For additional information on multinational operations, refer to JP 3-16, Joint Doctrine for Multinational Operations.

12. Interagency Cooperation and Coordination

Many operations involving US forces will also involve other USG agencies, as well as numerous NGOs, IOs, and regional organizations. Cooperation with these organizations also brings certain challenges to the JFC and joint force engineer and staff.

a. **US Government Agencies.** The JFC will be required to coordinate with USG agencies in order to achieve overall US objectives. **These agencies bring with them certain capabilities and funding for activities that can support the JFC's mission objectives.** Both DOS and USAID coordinate with NGOs and HN agencies to fulfill tasks and activities in support of US objectives. The JFC and joint force engineer and staff should coordinate with DOS and USAID to deconflict civil engineering efforts within the HN. In addition, the use of NGO or HN resources may reduce the civil engineering support required from the joint force.

- In many cases USAID funds civil engineering projects within the HN. This funding is conducted to both mitigate wartime or disaster situations as well as to bolster the HN economy. A lack of coordination between the joint force and the USG agencies could result in duplication of effort.

- Coordination with the USG agencies enables the joint force to leverage NGO or HN assets in support of projects for which the joint force does not possess sufficient resources or capability.

b. **Regional Organizations.** Regional organizations are usually equipped with the

resources and expertise to participate in complex interagency operations. In this respect, civil engineering projects can be more thoroughly planned and resourced for execution; however, support to these organizations must be planned carefully. Statutory restrictions on support from foreign organizations and governments should be addressed prior to the operation.

For additional information on interagency coordination, refer to JP 3-08, Interagency Coordination During Joint Operations.

13. Civil Engineering Support to Domestic Support Operations

The Department of Defense has the capability to rapidly respond to a broad range of emergencies within the United States and its territories. **The Department of Defense provides self-deploying, self-sustaining forces with a wide variety of skills and equipment, including engineer forces that play an essential role in domestic support operations (DSO).**

a. **Authorities Governing DOD Support to DSO.** In major disasters, state and local governments can be overwhelmed by the magnitude of the damage. In support of civil authorities, the Department of Defense can provide support to state and local governments. (See DODD 3025.1, *Military Support to Civil Authorities [MSCA]*). **In emergencies, there are several laws, executive orders, and plans that may engage DOD assets in response to civil emergencies.** The most prominent of these plans is the Federal Response Plan (FRP), which is executed under the Robert T. Stafford Disaster Relief and Emergency Assistance Act (Public Law 93-288) and managed by FEMA.

b. **Civil Engineering Mission in Support of DSO.** Given the nature of disaster operations in the United States, there is little opportunity for deliberate planning. In CAP, the joint force engineer has two supporting missions:

- Provide civil engineering support as part of a joint force; and
- Provide civil engineering support to USACE in its role as the lead planning and operating agent for Emergency Support Function (ESF) 3, "Public Works and Engineering," under the FRP.

c. **Coordination of Civil Engineering Missions in Support of DSO.** A JTF may be established by the supported combatant commander for major and catastrophic disasters. For DSO, mission planning takes place within the FEMA disaster field office (DFO). Requests for military support at the DFO are processed through the defense coordinating officer (DCO), the military official specifically designated to orchestrate DOD support. **The DCO is the single point of contact in the field for coordinating and validating the use of DOD resources** (excluding support provided by USACE in its role as the lead planning and operating agent for ESF-3, "Public Works and Engineering," under the FRP). As with the other ESF agencies, USACE coordinates its requirements for DOD support (e.g., joint force civil engineering support) through the DCO. The DCO coordinates requirements for DOD support with the combatant commander and subordinate JFC for execution. Mission requirements are usually developed with the other ESF representatives and are executed in support of their missions.

d. **Planning Considerations for Civil Engineering Support to DSO. Civil engineering planning is focused on taking immediate actions to save lives and property, assisting in stabilizing the disaster area, and withdrawing as quickly as possible.** As the DOD lead planning agent for ESF-3, USACE develops OPLANs for its

standing FRP missions. Joint force civil engineering planners should focus on planning considerations for rapid deployment of engineer units to meet immediate needs for saving lives and property, conducting missions to stabilize the situation in the disaster area, and providing engineering support to the joint force. Specific planning considerations include the following:

- Planning for civil engineering immediate response actions should include the following:
  - •• Civil engineering support requirements for emergency infrastructure repairs (e.g., emergency power and road clearing operations).
  - •• Time and routes for movement to the disaster area.
  - •• Status of communications infrastructure in the disaster area.
  - •• Possible requirements for military tactical bridging assets.
  - •• Access to real estate in the disaster area to support joint force beddown and operations.
  - •• Civil engineering requirements for support to deployed forces.
  - •• Need for protective equipment for operating in a contaminated environment due to NBC contamination or other environmentally threatening event.
  - •• Coordination with the DCO for support to USACE's ESF-3 missions.
  - •• Available imagery of the disaster area.
  - •• Information from disaster models run by FEMA and USACE.
- Planning for civil engineering recovery missions and redeployment should consider the following:
  - •• Duration of civil engineering support for deployed forces.

OPERATION ALASKAN ROAD

The individual readiness training (IRT) program is managed by the Assistant Secretary of Defense (Reserve Affairs) and allows the military to conduct realistic training that may not otherwise be affordable or available. Department of Defense-provided funds can only be used for cost over and above training expenses. Participating units must contribute their normal or planned training dollars for operating and maintenance expenses in the project. The projects must meet valid warfighting training requirements for military forces participation. The best example of an IRT project is Operation ALASKAN ROAD on Annette Island, Alaska. Operation ALASKAN ROAD is a joint military and community project to construct a 14-mile road on Annette Island linking the town of Metlakatla to the north end of the island where a new Alaskan State Ferry Terminal will be established. This will dramatically improve access to Annette Island, especially during the winter months.

VARIOUS SOURCES

•• Transition from military engineering forces to CCA contracting capabilities.

•• Requirements for debris clearance, removal, reduction, and disposal.

•• Potential need for emergency shelter beyond that provided by state resources.

•• Coordination with the DCO for support to USACE's ESF-3 missions.

•• Establishment of end state for the joint force civil engineering forces.

14. Individual Readiness Training

Historically, the Department of Defense has performed infrastructure development work in developing countries. However, no legislation existed to authorize similar domestic work. In 1993, Congress established the Civil-Military Cooperative Action Program funding — title 10, USC, section 2012.

Intentionally Blank

CHAPTER IV
CIVIL ENGINEERING SUPPORT OPERATIONS

"In two years of war in Korea, no single factor has so seriously handicapped Fifth Air Force operational capability as the lack of adequate air facilities."

Robert Futrell, *The United States Air Force in Korea*, 1950-1953

1. General

Civil engineering support operations can encompass both large-scale tasks requiring detailed design and logistic support as well as expedient operations in environments across the range of military operations. **During each phase of an operation from pre-hostilities to post hostilities and redeployment, civil engineering support operations enable joint force mission success.** Civil engineering support is provided to joint operations such as JRSOI, mobility and counter-mobility, advanced base development, JLOTS, force protection, and post hostilities operations as well as operations in support of rear area security and base defense. Support is also rendered to MOOTW missions, including FHA, disaster relief, and DSO. Figure IV-1 provides examples of support that civil engineering forces can provide within Service specific capabilities and limitations.

While the execution of civil engineering operations may be in a crisis response environment, **the employment of engineering forces requires a high degree of planning and control in order to effectively manage the limited civil engineering resources**. Additionally, engineer-intensive missions require extensive logistic support for materiel, fuel, equipment, and contract operations, all of which may involve substantial lead times, funding, and transportation. While civil engineering forces are capable of rapid deployment by air, facilitated by the use of organic specialized teams and kits, follow-on units and their equipment may require transportation by sealift due to the heavy equipment and may require the use of war reserve materiel stocks.

2. Civil Engineering Support During Phases of a Joint Operation

Civil engineering support should be planned and executed to meet the requirements of each phase of a campaign or major operation. Phasing assists the JFC and joint force engineer in defining the civil engineering support requirements in terms of forces, resources, and time. **The primary benefit of phasing is that it helps achieve the major objectives by planning manageable subordinate operations.** The joint force engineer and staff must determine how civil engineering support operations can be effectively executed in support of all phases of joint operations.

a. **Deter/Engage.** Civil engineering support operations during deter/engage are **those tasks that prepare the operational area for joint forces**. Successful accomplishment of civil engineering support is essential to maintain the schedule for force deployment and employment, as contained in the OPLAN and/or OPORD and TPFDD documents.

- One of the principal civil engineering tasks during deter/engage is to **establish advanced bases**. Deployments, no matter the scope or scale, require the establishment of advanced bases for the reception, beddown, and employment of personnel, equipment, and logistics. Engineers may also be tasked to establish intermediate staging bases (ISBs) in

Figure IV-1. Civil Engineering Support Operations

support of the advanced bases. While these bases may be identified in OPLANs and OPORDs, final placement of bases will depend on an evaluation of mission requirements, threat level, supporting infrastructure, expected duration of the deployment, and specific weapon system requirements. Support could be required by ground maneuver forces, naval vessels, aircraft, space support, or information systems.

- Advanced base development relies on the resources made available from pre-

positioned sources, HN agreements, local contracting for existing facilities and infrastructure, allied and coalition assistance, and deployed specialized teams and equipment. These resources can include billeting sets, vehicles, power generation systems, and consumable supplies. **Despite varying levels of capability, all engineering forces can conduct basic support operations** to include power generation, potable water supply, and support to mobility operations. Initial engineer operations to establish advanced bases and ISBs are listed in Figure IV-2.

b. **Seize Initiative.** The seize initiative phase entails the movement and buildup of a decisive combat force in the operational area. **Civil engineering support operations during the seize initiative phase focus on providing the support, facilities, and infrastructure systems necessary to move, receive, and beddown deploying forces.** These operations occur not only in the operational area, but also at locations within CONUS and at en route support sites.

- **Joint Reception, Staging, Onward Movement, and Integration**

•• JRSOI consists of receiving personnel, material, and equipment in theater and assembling them at designated staging sites; moving these units within the operational area; and integrating this capability into a military force ready to accomplish the assigned mission. Transportation and support infrastructure strongly influence the ability to rapidly execute JRSOI. A robust infrastructure of modern air and seaports, highways, railroads, and inland waterways greatly expedites the flow of forces, equipment, and logistic support. A lesser-developed or austere infrastructure can impede JRSOI, thereby slowing the deployment of the forces in the CINC's concept of operations, and may require an early deployment of support capabilities such as port opening teams and engineering units.

•• **Civil engineering supports JRSOI through a variety of means, including**

Figure IV-2. Initial Base Development Operations

An Army bridging company positions pontoons.

improving or constructing airports, seaports, highways, railroads, bridges, tunnels, and communications infrastructure. Civil engineers can also perform expedient repairs to battle damaged JRSOI infrastructure and support systems. As an example, each of the Services (within their limitations and training) can perform soil stabilization and bituminous paving in order to return an MSR to operational condition. If these repairs are expedient in nature, subsequent operations may be required to restore the JRSOI supporting infrastructure to fully capable status.

For additional information on JRSOI, refer to JP 4-01.8, Joint Tactics, Techniques, and Procedures for Joint Reception, Staging, Onward Movement, and Integration.

- **Joint Logistics Over-the-Shore Operations.** JLOTS operations are

Army equipment is offloaded across a temporary floating "causeway" made up of Navy lighterage causeway sections installed by Navy amphibious construction battalion SEABEEs.

logistics over-the-shore operations conducted by forces from two or more Military Services. JLOTS operations are conducted over unimproved shorelines, through fixed ports not accessible to deep draft shipping, and through fixed ports that are inadequate without using JLOTS capabilities. The establishment of JLOTS capability requires a period of preparation and facility installation that will precede the initiation of JLOTS operations. Typical civil engineering support activities in support of JLOTS operations are shown in Figure IV-3.

For additional information on JLOTS operations, refer to JP 4-01.6, Joint Tactics, Techniques, and Procedures for Joint Logistics Over-the-Shore (JLOTS).

- **Real Property Support to Joint Operations**

•• Civil engineering support operations facilitate the acquisition, preparation, operation, repair, and recovery of real property assets. Real property assets include land, buildings, structures, utility systems, and equipment attached to and made part of the building. Examples in the operational area include HN ports, airfields, support bases, and buildings allocated for use by deploying forces. Figure IV-4 lists typical real property support to joint operations.

•• Logistics planning elements, including civil engineers, develop the contracts, leases, and support agreements

CIVIL ENGINEERING SUPPORT TO JOINT LOGISTICS OVER-THE-SHORE OPERATIONS

- ***Conduct** beach reconnaissance*
- ***Perform** hydrographic surveys*
- ***Conduct** and document baseline environmental survey*
- ***Establish** and maintain lighterage and amphibious discharge sites*
- ***Establish** and maintain beach roadways, landing pads, and storage areas*
- ***Install** and maintain bulk fuel and/or water systems and storage points*
- ***Prepare** beach interfaces for amphibious systems*
- ***Clear** obstacles*

Figure IV-3. Civil Engineering Support to Joint Logistics Over-the-Shore Operations

Figure IV-4. Real Property Support to Joint Operations

necessary to secure real property assets required for mission support. Once assigned real property assets, Service component commanders are responsible for the management, use, maintenance, and disposal of these assets. Disposal of these assets may require varying levels of reconstruction, waste recovery, and environmental cleanup. The terms and conditions of use, maintenance, and disposal should be established prior to the acceptance of the real property assets.

c. **Decisive Operations.** Despite the shift of operational focus that occurs during this phase of an operation, civil engineering support mission to sustainment is essential to the success of joint operations and the overall mission. Specific civil engineering operations can also be executed in support of base defense, force protection construction support, and battle damage repair. **The intent of these operations is to enhance the survivability of deployed forces, support mission execution, and accomplish operational objectives.**

- **Sustainment** includes the civil engineering support activities required for effective operation of advanced bases, LOCs, ISBs, and other civil engineering support activities. **Sustainment**

operations build upon the initial tasks by improving and expanding basic systems, thus enhancing mission capability and quality of life. Examples of essential civil engineering support to sustainment activities include installing central power plants, contracting base service support, replacing field latrines with dedicated portable assets, and implementing quality of life improvements to billeting areas. Civil engineering support to sustainment operations may also entail replacing bare base tents and other equipment with more robust temporary structures. These structures can be acquired, installed and operated by deployed engineering units or through contingency contracting procedures.

- **Base Defense and Force Protection.** Beyond the requirements to operate and sustain advanced bases, civil engineering operations support base defense and force protection construction support activities during all phases of an operation. Figure IV-5 contains notional work priorities for civil engineering support operations for base defense. **Civil engineering operations also accomplish specific requirements for area damage control (ADC) in support of base defense.** ADC includes the measures taken before, during, and after hostile action or natural and accidental disasters to reduce the probability of damage and minimize adverse effects. Plans for base construction and operations must consider ADC requirements. Plans for ADC should also include the joint force capabilities and a summary of potential threats against the advanced base.

  For additional information on base defense, refer to JP 3-10.1, Joint Tactics, Techniques, and Procedures for Base Defense Operations.

- **Battle Damage Repair. Civil engineers have the primary responsibility for battle damage repair of the various systems and support facilities required**

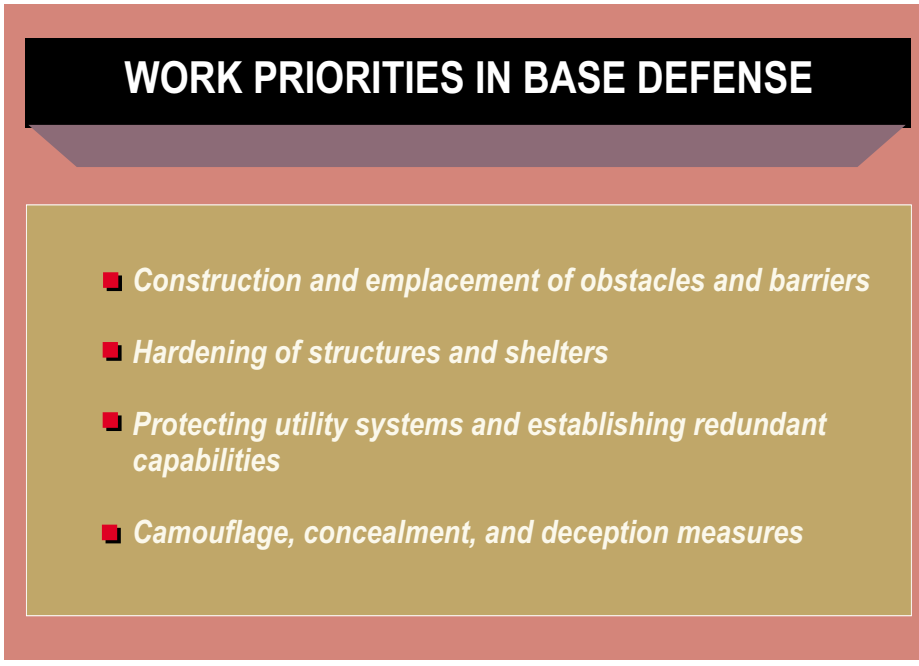


Figure IV-5. Notional Work Priorities in Base Defense

to sustain, maintain, and restore base operations. Battle damage repair also includes operations to clear MSRs and LOCs, repair JRSOI infrastructure, recover JLOTS systems, and restore other essential infrastructure. Battle damage repair should be limited to the minimum essential repairs required to return the essential service, equipment, or facility back to adequate service capable of accomplishing the mission. As such, the repairs may be improvised, carried out in a battle environment, or involve the use of specialized equipment (e.g., rapid runway repair sets). If possible, repair priorities should be developed and coordinated prior to hostilities. HN facilities and real estate should be restored as closely as possible to the existing condition prior to use before turnover to the HN. The joint force engineer, in concert with the joint force J-4 and J-3, develops and prioritizes the list of requirements and monitors repairs. Notional battle damage repair priorities are listed in Figure IV-6.

d. **Transition.** The transition phase of a campaign or major operation represents transitions from war to peace; from military-led operations to predominantly civilian-based activities; and from planned operations to a fluid set of situational priorities. Transition operations require coordination and cooperation to ensure that plans and ongoing operations are adjusted and that the shift towards support of the other instruments of national power occurs smoothly. Civil engineering operations in support of transition occur in conjunction with the mission to sustain the force, operate bases, and engage in force protection construction support. Civil engineering support operations may include those listed in Figure IV-7. Civil engineering support operations should be integrated within the overall post hostilities mission. These elements can include interagency organizations, such as DOS, and other organizations including NGOs and IOs (e.g., International Red Cross). With the transition to post hostilities and termination of military presence, formal documentation of the process and decisions with the appropriate

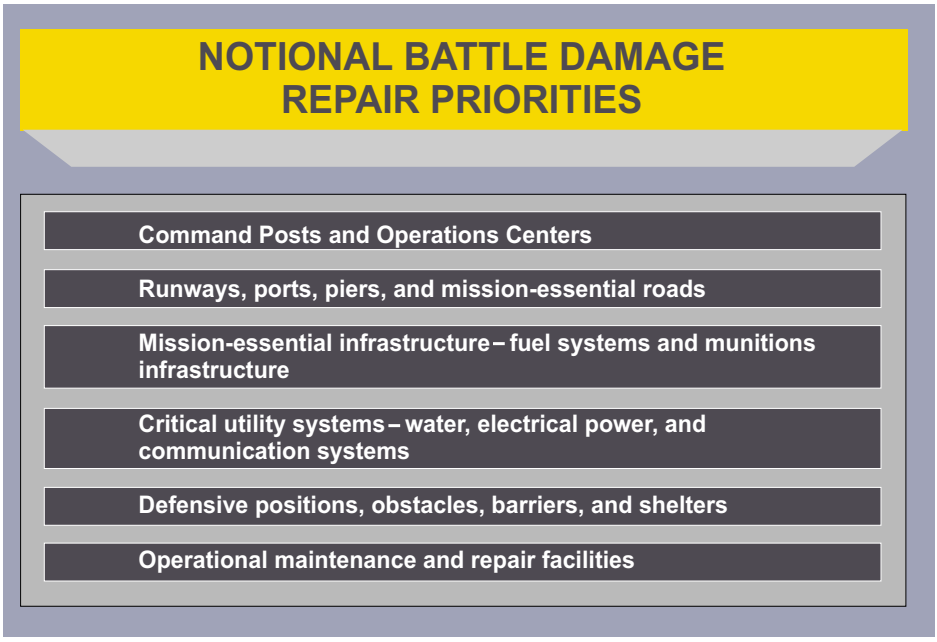


Figure IV-6. Notional Battle Damage Repair Priorities

Figure IV-7. Civil Engineering Support to Transition Operations

approval authorities is essential. The joint staff legal counsel should review all staffing actions to ensure consistency with applicable US and HN law and theater direction and policies, especially legal issues involving funding and resources.

3. Military Operations Other Than War

MOOTW are generally unified actions that integrate joint, interagency, and multinational operations to achieve the strategic end state. MOOTW encompass a variety of military operations as shown in Figure IV-8. A distinct characteristic of MOOTW is the potential for both noncombat and combat operations by the joint force. MOOTW can also occur within the United States and its territories. **Civil engineering operations will play an important role due to the substantial requirements (e.g., shelters, facilities, and basic utility systems) not only to sustain the force, but also to support humanitarian needs.** Effective engineer liaison with all involved military units and civilian agencies is critical to the successful conduct of MOOTW.

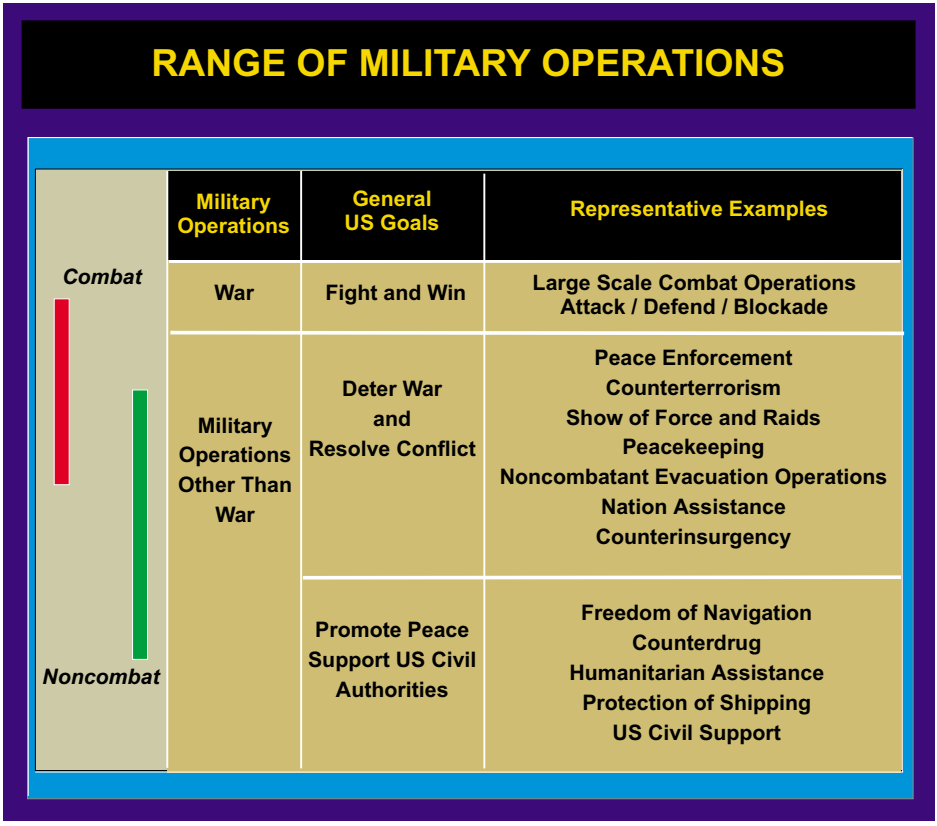


Figure IV-8. Range of Military Operations

For additional information on MOOTW, refer to JP 3-07, Joint Doctrine for Military Operations Other Than War.

a. **MOOTW in Foreign Locations.** The preponderance of civil engineering support operations conducted in support of MOOTW will be conducted in foreign locations. Operating in these locations can significantly impact the engineer mission in terms of logistics, cooperation with HN, legal implications, and force protection requirements. Civil engineering support to principal foreign MOOTW may include the following:

- **Foreign Humanitarian Assistance.** FHA operations relieve or reduce the results of natural or manmade disasters or other endemic conditions such as human pain, disease, hunger, or privation. Typical FHA engineer missions are listed in Figure IV-9. FHA support provided by US forces is generally limited in scope and duration and is intended to supplement or complement efforts of HN, government agencies, NGOs, and IOs. US military forces may be the only organization in the operational area capable of providing assistance. US military forces transition FHA support to civilian authorities as soon as possible. Requests for military support, including civil engineering support, should continue to be initiated and coordinated through the CMOC.

For additional information on FHA operations, refer to JP 3-07, Doctrine for Military Operations Other Than War, *and JP 3-07.6,* Joint Tactics, Techniques,

Figure IV-9. Civil Engineering Support to Foreign Humanitarian Assistance Operations

and Procedures for Foreign Humanitarian Assistance.

- **Humanitarian and Civic Assistance.** HCA programs, under title 10, USC, section 401, are separate and distinct programs from FHA. HCA are preplanned activities conducted in conjunction with military operations and exercises. These operations typically fulfill a unit-training requirement that incidentally creates humanitarian benefit

JTF 160 "OPERATION SEA SIGNAL"

From August 1994 to February 1996, engineers from the Army, Air Force, Navy, and Marine Corps deployed to Naval Station Guantanamo Bay, Cuba, in support of Operation SEA SIGNAL, [Joint Task Force] JTF 160. JTF 160 was tasked with the processing, billeting, and sustainment of over 40,000 Cuban and Haitian migrants awaiting repatriation or parole to the United States. Operating under the centralized planning control of the J-4 [Logistics Directorate] engineering staff, the Service engineers carved out migrant communities from the rock- and cactus-strewn landscape. The migrant communities, built by military engineers and migrant volunteers, featured hard backed billeting tents, tension fabric structure community centers, concrete masonry block bathhouses, and large recreation areas. The engineers also established military support camps for 7,000 deployed personnel, logistics yards, and utility support systems. Significant events included a 10-mile long water distribution pipeline, over 900,000 square feet of covered storage space, and three 1 million gallon waste water evaporation lagoons.

SOURCE: JTF 160 After Action Report, August 1996

to the local population (i.e., training and skills development). Civil engineering operations in support of HCA include the following categories of support:

•• Construction of rudimentary surface transportation systems;

•• Water well drilling and construction of basic sanitation facilities;

•• Rudimentary construction and repair of public facilities (e.g., schools, medical clinics, community centers, etc.);

•• Training and skills development of HN personnel; and

•• Site surveys and development of construction plans.

For additional information on HCA, refer to JP 3-07.1, Joint Tactics, Techniques, and Procedures for Foreign Internal Defense.

- **Peace Operations.** Peace operations encompass peacekeeping operations and peace enforcement operations conducted in support of diplomatic efforts to establish and maintain peace. Military peace operations are tailored to each situation and may be conducted in support of diplomatic activities before, during, or after conflict. Peace operations may be of very long duration, such as the US commitment to the Multinational Force Observers in the Sinai since 1982, or more recently, commitments to Southern and Northern Watch, Southwest Asia, and NATO peacekeeping operations. The civil engineer's role in peace operations (either peacekeeping or peace enforcement), typically changes as the nature of the operation evolves. For example, peace enforcement operations in East Timor were initially complex, multi-faceted relief operations, then transitioned to a JTF, commanded by a Service Civil Engineer.

  •• These long-term operations require significant civil engineering support, especially in the initial phases of a joint operation. A long-term operation requires a higher degree of facility construction and services (e.g., utilities) in order to maintain morale and quality of life. As the operation transitions to a more stable environment, military

VENEZUELA (1999)

In Venezuela on December 15, 1999, torrential rains created massive and widespread landslides and flooding. The landslides crushed homes, businesses, schools, vehicles, and people. Entire villages were inundated, and many vanished altogether. The death toll was estimated as high as 50,000. Within hours the military organized a military joint task force and embarked on Operation FUNDAMENTAL RESPONSE, orchestrated by the US Southern Command. Troops from the Army, Navy, Marines, and Air Force — including active duty, guard, and reserve units — responded. They moved thousands of people to safety, transported hundreds of thousands of pounds of food and medical supplies, and provided sanitary water. The 192nd Support Battalion deployed with their state-of-the-art 3,000 and 6,000 gallon-per-hour Reverse Osmosis Water Purification Units. Military units also cleared and repaired large stretches of roads, opening routes for the recovery efforts.

SOURCE: *Disaster in Venezuela: Joint Force Respond*, The Military Engineer, May-June 2000, Issue No. 605, p 71-73)

engineers can be replaced by contingency contracting (e.g., LOGCAP, CONCAP, and AFCAP).

•• While engaged in peace operations, military engineers may support peace-building tasks. Peace-building consists of postconflict actions that strengthen and rebuild governmental infrastructure and institutions in order to avoid a relapse into conflict. Specific civil engineering missions could include rebuilding roads, utility systems, and essential infrastructure.

For additional information on peace operations, refer to JP 3-07.3, Joint Tactics, Techniques, and Procedures for Peace Operations.

b. **Domestic Support Operations.** DSO are conducted by US military forces in CONUS, its territories, and possessions in support of civil government agencies. (See DODD 3025.1, *Military Support to Civil Authorities [MSCA]*). US military forces provide support in response to domestic emergencies that endanger life or property, or that disrupt the usual process of government. Natural disasters including hurricanes, earthquakes, forest fires, and floods as well as manmade disasters or emergencies including oil spills are situations in which military support to civil authorities may be required. The US military usually supports other federal agencies in providing assistance. Before a military response to a domestic emergency can be initiated, state and/or local authorities must request assistance and a presidential declaration of a major disaster or an emergency must be issued.

- The predominant form of DOD DSO is disaster response under the FRP, managed by FEMA. Under the FRP, FEMA is charged with primary responsibility for coordination of federal assistance (including military support) to state and local governments. US military forces are generally used to respond to natural disasters or manmade disasters or emergencies in support of affected state and local governments.

- When a disaster exceeds the capabilities of state and local authorities, the Governor will request assistance from the President of the United States. When the President directs federal assistance, the Director of FEMA will implement the FRP committing the unique capabilities of 12 ESFs to support FEMA during federal disaster response. DOD

Marine Corps engineers conduct civil engineering operations in Grenada.

involvement in disaster relief begins with a Presidential declaration. FEMA designates a Federal coordinating officer to coordinate on-scene Federal effort at a DFO. Requests best suited for military assistance are forwarded to the Secretary of the Army as the DOD executive agent. The Secretary of the Army will designate the Director of Military Support (DOMS) as the executing agent. At the direction of DOMS and in coordination with the Chairman of the Joint Chiefs of Staff, the supported CINC appoints a DCO to coordinate all DOD support (except for support provided by USACE as the lead planning and operating agent for ESF 3, "Public Works and Engineering," under the FRP). In turn DOMS coordinates requests with the Chairman of the Joint Chiefs of Staff and the Office of the SecDef and then directs the supported CINC to provide the support requested. The supported CINC deploys the DCO and may also establish a JTF to provide support. Relationships are shown in Figure IV-10.

- Most DOD support is focused on response operations, with a declining level of support to recovery operations. **The key DOD objectives are to take immediate actions to save lives and property, assist in stabilizing the area, and withdraw as quickly as possible.** Federal response and recovery under the FRP focus on two basic areas - infrastructure (engineer dominant) and human services (engineer support).

- Engineers are part of the primary effort in major disaster response operations. **Engineer operations focus on the infrastructure response and recovery missions.** Engineers should be among the first to deploy, as the completion of engineer emergency response missions are required in order for other response organizations to execute their missions.

- In disaster response and recovery operations, engineer operations are part of the critical support provided by USACE and the JTF. Relationships are shown in Figure IV-11. Upon activation

HURRICANE ANDREW (1992)

Hurricane Andrew hit south Florida on August 24, 1992. In terms of property destruction, Hurricane Andrew was the worst natural disaster ever to befall the United States at that time. Hurricane Andrew destroyed $20 billion in property, demolished 25,000 homes, and seriously damaged another 50,000. About 175,000 people were left homeless. Soon after the devastation, President Bush ordered the [Department of Defense] to provide domestic support. The day after that declaration a convoy of US Army vehicles moved in, delivering portable kitchens and other supplies. Marines from Camp LeJeune, North Carolina set up 108 tents and support facilities at Harris Field, which became home to many who had nowhere else to live. The Army 82nd Airborne and Florida Army National Guard assisted local law officials providing security to residents and merchants. The Air Force airlifted 14,000 tons of relief cargo in the first ten days and 21,400 tons of cargo and 13,500 passengers and flew 724 missions by the end of the support effort.

SOURCE: *The Big One: Hurricane Andrew*, Miami and El Nuevo Heralds, book design and editing by Roman Lychowski and Steve Rice

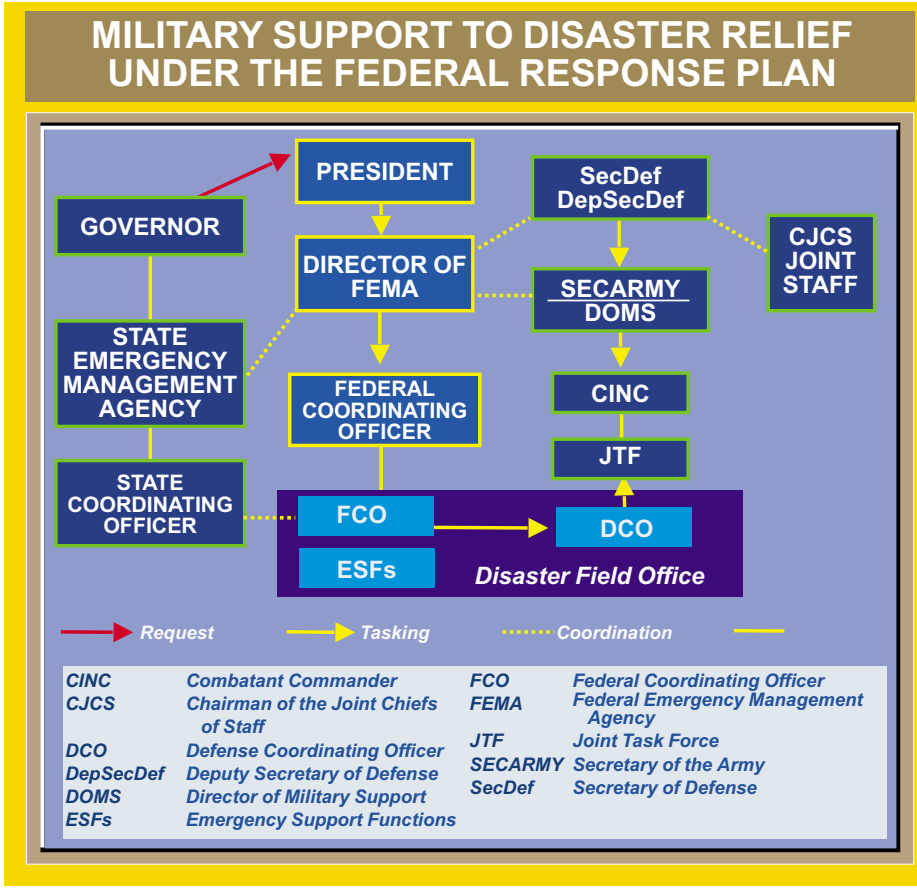


Figure IV-10. Military Support to Disaster Relief Under the Federal Response Plan

of ESF-3 by FEMA, USACE deploys an Emergency Response and Recovery Office (ERRO) to commence planning and execution of ESF-3 tasking from FEMA. Under standard FRP procedures, USACE provides requests for JTF engineer support to the DCO and subsequently provides ESF-3 missions for the JTF engineer units to execute. The most effective way to coordinate and effectively manage engineer activities and assure unity of effort between USACE, its contractors, and JTF engineers is for the executing USACE commander of the ERRO to coordinate assignment of potential ESF-3 missions for the JTF with the JTF engineer and DCO.

- Engineering units from the Military Services may be involved in DSO. Typical size units include the Naval mobile construction battalions, Air Force Prime BEEF and RED HORSE units, Army combat heavy engineer battalions, and battalion- or company-reinforced task-organized engineer detachments from Marine Corps engineer support battalions. Specialized units may include bridging, water well drilling, power generation, and water purification units. Typical DSO civil engineering support missions are listed in Figure IV-12.

For additional information on DSO, refer to JP 3-07.7, Joint Tactics, Techniques, and Procedures for Domestic Support Operations.

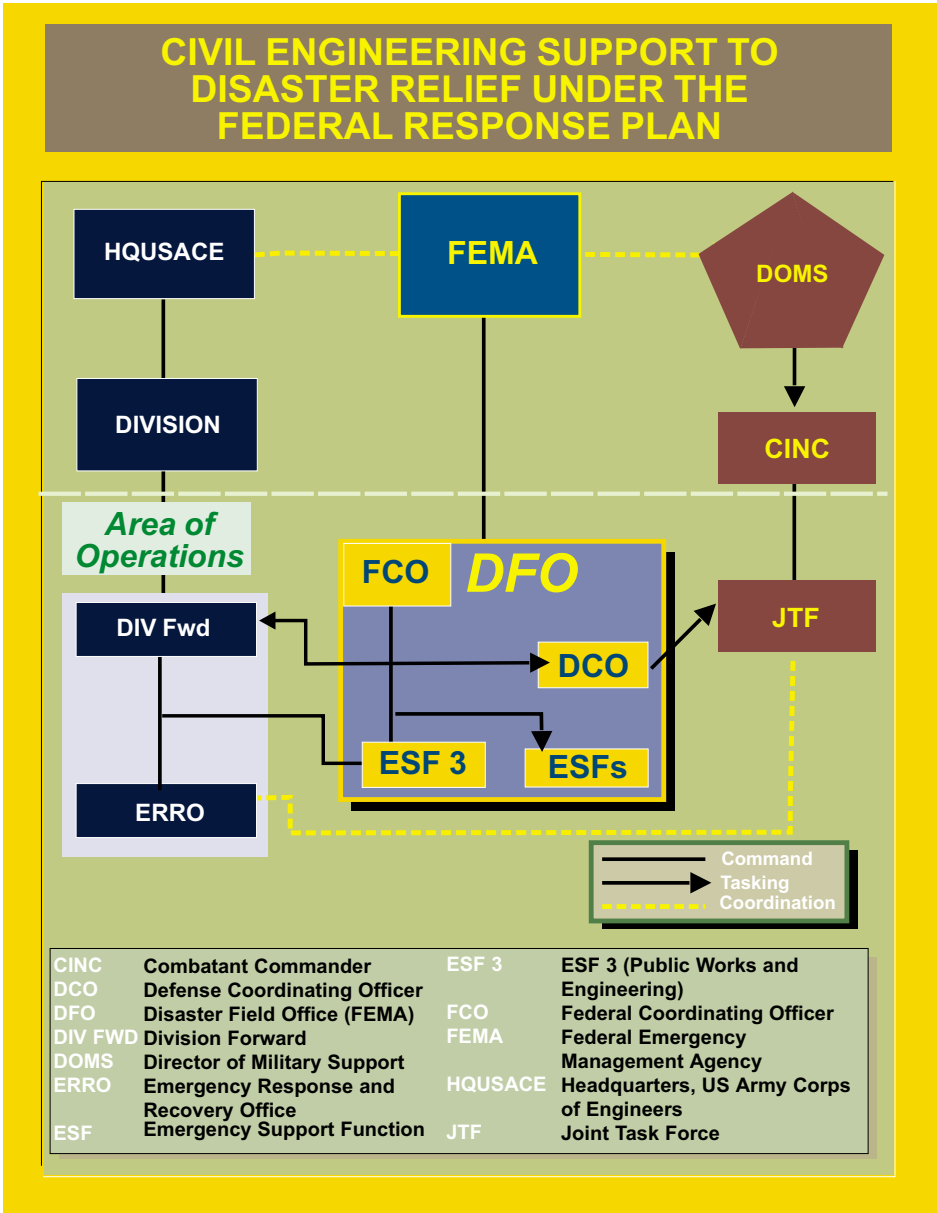


Figure IV-11. Civil Engineering Support to Disaster Relief Under the Federal Response Plan

4. Specialized Civil Engineering Support Operations

a. In addition to what is considered typical civil engineering capabilities (e.g., horizontal and vertical construction), **each Service has certain specialized civil engineering capabilities (including engineering technical and contract support) and environmental support capabilities**.

b. The following examples of specialized civil engineering capabilities reside in one or more of the Services.

CIVIL ENGINEERING SUPPORT TO DOMESTIC SUPPORT OPERATIONS

Typical engineering support missions include:

- Clearing debris
- Re-establishing utilities
- Restoring public facilities
- Restoring infrastructure
- Emergency power and lighting
- Sanitation
- Potable water production and distribution
- Support to urban search and rescue
- Construction of temporary facilities
- Construction and operation of camps and temporary shelters
- Wildfire response and support operations
- Environmental assistance - (e.g., oil spill and hazardous material response)

US Army Corps of Engineers immediate response missions

- Conduct power assessments and install emergency generators to provide emergency power using the 249th Engineer Battalion (Prime Power)
- Clear debris, build temporary shelters, and conduct emergency repairs to public facilities using contractors

Joint task force engineers may conduct the following

- Emergency debris clearance from critical transportation facilities
- Emergency repairs to public facilities
- Emergency power for critical public facilities

Major infrastructure recovery missions for engineers include:

- Perform emergency debris removal from roads and transportation facilities
- Clear, reduce, and dispose of debris
- Provide temporary housing
- Provide temporary roofing for housing

Figure IV-12. Civil Engineering Support to Domestic Support Operations

- **Fire Protection —** Includes aviation, structural, rescue and hazardous material and WMD response.

- **Explosive Ordnance Disposal —** Includes rendering safe and disposing of hazardous munitions, response to improvised explosive device and WMD incidents, and force protection assessment support.

- **NBC Defense** — Includes NBC disaster preparedness planning, training, response, detection, and decontamination within Service limitations.

- **Civil-Military Operations** — Training, planning, resource sharing, and heavy equipment support.

- **Construction Contracting, Engineering Support Contracting, and Engineering Technical Support** — Expedient support including construction project design and construction contract administration (e.g., USACE contracts for disaster relief operations). Each Service component also has the ability to reach back for additional technical engineering support from a mixture of engineering service centers, specialized research and development centers, and contract resources.

- **Facilities Engineering and Management** — Engineering support including comprehensive project planning, design and management for maintenance, repair, restoration, and construction of facilities and infrastructure.

- **Water-well drilling** — Includes siting, surveying, and drilling of water wells.

- **Underwater Construction** — Includes site surveying, design, and construction of underwater projects including piers, bulkheads, and other structures to support seaports of embarkation and SPODs.

- **Concrete and Asphalt Production and Quarry Operations** — The erection and operation of concrete and asphalt production plants and quarry operations to support runway, road, and other large scale concrete and asphalt usage projects.

- **Environmental Support Operations.** The intent of environmental support operations is to minimize adverse environmental impact, ensure the safety and health of personnel, and reduce post-deployment environmental cleanup. Typical environmental support operations are listed in Figure IV-13. While deployed civil engineering units may have the capability to provide environmental support, the use of contractors is usually required for long-term or large-scale projects.

  For additional information on environmental support, including regulatory guidance and planning factors, refer to Chapter VI, "Environmental Considerations."

5. Civil Engineering Reporting

a. The JFC requires accurate and timely information to effectively plan and execute joint operations in support of the mission. **The JFC requires accurate status on civil engineering support as part of ensuring timely logistic support and sustainment of joint operations.** Status of the following civil engineering support is essential: deployment of engineering forces and assets; construction and improvement of LOCs including APODs, SPODs, and MSRs; force beddown and construction of advanced bases, base camps, operations, maintenance, and logistic facilities; engineer manpower, equipment, and construction material; and environmental

Figure IV-13. Environmental Support Operations

conditions. The Service components generally submit reports to the JFC varying from daily to weekly, depending on the situation and established reporting requirements from the JFC and higher headquarters. The joint force engineer and staff provide guidance and collect, consolidate, and track essential civil engineering status reports to effectively monitor execution and recommend changes to the JFC in a timely manner. **The joint force engineer and staff develop specific format, contents, and rating systems, based on JFC requirements and instructions.**

b. Important aspects in civil engineering status reports may include the following:

- APOD construction and improvement — runway condition, barriers, and construction projects.
- SPOD construction and improvement — port berthing status, beach status, littoral support assets, and construction projects.
- LOCs — MSRs, bridges, railroads, and waterways.
- Force beddown — Advanced base and ISB status, force protection construction support, and major projects.
- Engineer manpower — military, civilian, HN, and contractors.
- Engineer equipment — in-service rates and critical maintenance.
- Class IV material — quantity reports, delivery dates, and HN support status.
- Environmental — reportable incidents and materials.

Intentionally Blank

CHAPTER V
CIVIL ENGINEERING CAPABILITIES

"Every time I pass a bulldozer, I want to stop and kiss it."

W.F. Halsey: On Guam, 1945

1. General

The Military Services have civil engineering capabilities to support the JFC in accomplishing a variety of mission requirements in any environment. **An understanding of the Services' civil engineering capabilities allows the JFC and joint force engineer to tailor the engineer force to effectively and efficiently accomplish the mission in support of joint operations.** Engineers can operate effectively in a joint environment, multinational environment, and with civilian contractors, US agencies, NGOs, and IOs. The JFC should understand joint, multinational, and interagency engineer capabilities to properly integrate them into the joint operation. **The joint force engineer is responsible for providing comprehensive recommendations to the JFC on the effective employment of civil engineering forces and capabilities in support of joint and multinational operations.**

2. Army Capabilities

a. **Army Engineer Units.** Army engineer units provide an extensive capability to plan and implement combat, civil, and topographic engineering missions to support joint and multinational operations across the range of military operations. Army engineer units provide key planning and coordination support in addition to the abilities to construct, maintain, and repair facilities, MSRs, heliports, ports, railroads, bridges, and LOCs, conduct quarry operations, and perform real estate, environmental, and facility engineering functions.

b. **Specialized Engineering Capabilities.** The Army maintains a variety of specialized engineering capabilities (see Figure V-1).

c. **Civil Engineering Technical and Contract Support.** USACE is the Army's major command assigned responsibility to execute Army and DOD military construction,

Army engineers assemble a pontoon bridge.

Figure V-1. Army Specialized Engineering Capabilities

real estate acquisition, and development of the nation's infrastructure through the Civil Works program. With its subordinate divisions, districts, laboratories and centers, USACE also has the capability to support civil engineering operations by providing technical assistance and contract support to joint forces deployed worldwide. The relationship between the supporting USACE district and the joint force should be specified during the planning process. For example, in Korea, the Far East District is in direct support of US Forces Korea in a contingency. The Army Environmental Center provides full spectrum environmental program support and contract services.

For additional information on Army capabilities, refer to Appendix A, "Engineering Units of the Army," and Appendix E, "Contract Construction Agents."

3. Navy Capabilities

a. **Navy Engineer Units.** The Naval Construction Force, organized primarily as Navy construction engineer (SEABEE) units, performs both generalized and specialized construction missions in support of the joint force, Navy and Marine Corps components, and other Service components. Naval mobile construction battalions (NMCBs) possess robust vertical construction, bridging, and

Navy SEABEEs constructing berthing facilities.

heavy earth moving capabilities. NMCBs construct roads for supply routes, extend or construct airfields, construct ammunition supply points, install expeditionary airfields, and provide all types of force beddown and logistic facilities. Operationally, SEABEE units can operate as task-organized detachments. This flexible C2 structure allows SEABEEs to respond with the right level of engineering expertise at the right time in the right place. The NMCB air detachment, a company-sized team of SEABEEs ready to deploy in 48 hours, can be task-organized to meet a specific mission. All equipment and supplies to support one NMCB and one naval construction regiment (NCR) headquarters are being pre-positioned in each maritime pre-positioning squadron. The NCF provides general engineering support to the joint force, Navy and Marine Corps components, and other Service components. NCF units are necessary to reinforce and augment the Marine Corps' limited general engineering capability. The normal employment of the NCF is as a major subordinate element within the MAGTF to maximize engineering capabilities available to the MAGTF commander.

b. **Specialized Capabilities.** Navy engineer units have specialized capabilities for performing engineering work at the water and shore interface in support of amphibious operations or other beach operations. Amphibious construction battalions (ACBs) operate and maintain causeway barge ferries, erect elevated causeway systems (ELCASs), install the OPDS, install the amphibious assault bulk fuel and water system, and provide construction, engineering, camp services and defense for the Navy support element (NSE) in support of assault echelon, assault follow-on echelon, MPF, Navy logistics over-the-shore, and JLOTS operations. Underwater construction teams (UCTs) provide underwater construction expertise to facilitate port opening or closing operations and beach and port surveys, in addition to providing support to OPDS installation. SEABEEs also possess specialized capabilities to include water well drilling, bridging, utilities operations, quarry operations, and concrete and asphalt paving operations.

c. **Civil Engineering Technical and Contract Support.** NAVFACENGCOM provides engineer planning and design, project management, construction, operations and maintenance, base operations support for shore based and ocean facilities, and real estate and facility engineering. Officer in charge of

construction (OICC) units can be tailored to provide contract award and administration, military or civilian real estate contracting, and CONCAP supervision during contingency operations. NAVFACENGCOM has mobile utilities support equipment teams which provide temporary or short term utility support. Technical engineering support for environmental issues and military engineer augmentation for joint staffs is also available. NAVFACENGCOM can provide a wide variety of technical expertise on amphibious delivery systems and ocean and deep ocean facilities (see Figure V-2).

For additional information on Navy capabilities, refer to Appendix B, "Engineering Units of the Navy," and Appendix E, "Contract Construction Agents."

4. Air Force Capabilities

a. **Air Force Engineer Units.** Air Force units are organized as Prime BEEF or RED HORSE units, which provide support from expeditionary civil to general engineering across the range of military operations. Air Force engineering units can deploy either as part of an AEF, or as detached units operating in support of specific missions and operational tasking. Prime BEEF forces can conduct construction, maintenance, repair, fire protection, NBC (includes disaster preparedness planning, training, detection, and decontamination within Service limitations), force protection, and EOD operations. RED HORSE squadrons are organized and deployed for austere, independent operation, to execute heavy

Figure V-2. Navy Civil Engineering Technical and Contract Support

RED HORSE engineers can execute heavy horizontal construction projects, constructing large concrete runways, taxiways and ramps, and roads.

horizontal and vertical construction projects; site development; construction and repair of runways, taxiways, ramps, roads, and revetments; heavy earthwork; and construction and repair of facilities and infrastructure. General capabilities shared by Prime BEEF and RED HORSE include site surveys, bare base construction using mobility assets (e.g., HARVEST FALCON and HARVEST EAGLE), concrete and asphalt paving, and utility system installation (e.g., water, waste, and electrical). RED HORSE expands on this capability by providing automatic building machine (k-span) support, large-scale concrete and paving operations, heavy horizontal and vertical construction, water well drilling, water purification, and quarry operations.

b. **Specialized Capabilities.** Air Force engineer units have specialized capabilities to support all aspects of airfield operations, including rapid runway repair, installation of aircraft arresting systems, war damage repair, and force beddown. Other engineer functions such as fire protection (e.g., structural, aircraft crash fire rescue, and hazardous material response), EOD (e.g., munitions support, antiterrorism, and civil assistance), and NBC (including disaster preparedness planning, training, detection, and decontamination within Service limitations) are also provided by deploying civil engineering teams. Specialized support includes installation and operation of emergency airfield lighting systems, mobile aircraft arresting systems, reverse osmosis water purification, and munitions storage site construction, HAZMATs, and initial WMD response.

c. **Civil Engineering Technical and Contract Support.** A variety of other supporting organizations separate from Prime BEEF and RED HORSE units provide technical engineering, environmental, and contract support for the joint force. The Air Force Civil Engineering Support Agency (AFCESA) provides technical support, training, and administers the AFCAP program. Additionally, AFCESA provides specialized civil engineer maintenance, inspection, and repair teams to assess pavement and runway conditions along with teams to conduct field maintenance and repair of specialized equipment. The Air Force Center for Environmental Excellence provides a wide range of environmental program support and contract services.

For additional information on Air Force capabilities, refer to Appendix C, "Engineer Units of the Air Force."

5. Marine Corps Capabilities

a. **Expeditionary Force.** The Marine Corps is an expeditionary force-in-readiness. Marine Corps engineer units are organized primarily to provide combat engineering support and civil engineering support to the three MEFs or smaller task-organized MAGTFs. The engineer force is organized to accomplish specific tasks of limited duration. Marine Corps civil engineering is temporary in nature due to its organization and mission, which focuses on expeditionary engineering support to the MAGTF. Civil engineering capabilities include but are not limited to construction of expeditionary airfields, forward operating bases, landing zones, roads for supply routes, and small-scale construction operations. The Navy provides civil engineering support to the Marine Corps through NCF units under the operational control of a MAGTF commander. NCF units are necessary to reinforce and augment the Marine Corps' civil engineering capability.

b. **Specialized Capabilities.** Specialized capabilities of Marine engineers include erection of standard bridging and rafting, construction of non-standard bridging, mobile electric power, production and storage of potable water, and EOD. Marine engineers have the capability to construct, improve, and maintain airfields to include those of an expeditionary nature. Marine engineers also maintain and operate bulk fuel systems. Marine engineers are integrated with their combat elements under the MAGTF concept of operations.

Marine Corps engineer units provide combat and civil engineering support

For additional information on Marine Corps capabilities, refer to Appendix D, "Engineering Units of the Marine Corps."

6. Construction Contracting and Engineering Support

Use of construction contracting and engineering support can play an important role in support of joint operations. Civilian construction contractors and HN engineering support can provide the JFC with a significant engineering capability to be leveraged as a force multiplier by allowing the joint force military engineering units to concentrate on tasks in high threat areas.

a. **Civilian Contractor Support.** Civilian contractor support, under the right circumstances, provides a tremendous capability for civil engineering support. **Contractor support can be provided by US-based contractors, HN contractors, or from other contractors located in the operational area.** Contract support can be used to provide real estate services and management, technical

engineering support such as surveys and designs for complex facilities, and the construction and operation of facilities and force beddown.

b. **Contract Construction Agents. Contract administration support is critical to the expeditious award, efficient management, and proper funding of design and construction contracts.** USACE and NAVFACENGCOM are the Department of Defense's principal engineer organizations to plan, design, construct, and acquire facilities and real estate. Inherent in their mission support capabilities is a planning and engineering capability for theater advanced base and infrastructure development. These organizations also maintain associated in-depth expertise in engineering research and development. The Air Force also maintains a limited capability in contract construction in contingencies as well as facility and real estate acquisition (in England, Turkey, Spain, and Israel).

- The DOD construction agents (see DODD 4270.5, *Military Construction Responsibilities*) are USACE, NAVFACENGCOM, or other such approved DOD activity. Their responsibilities include the design, award, and management of construction contracts for projects associated with the peacetime military construction program. Overseas, USACE, NAVFACENGCOM, and the Air Force are assigned specific geographical areas under DODD 4270.5, *Military Construction Responsibilities*.

- The CINC may also use USACE and NAVFACENGCOM as contingency CCAs for design, award, and management of construction contracts in support of military operations. For countries where there is no designated DOD construction agent, the CINC will usually designate a CCA for support in a contingency.

- USACE and NAVFACENGCOM also provide facilities planning, contract administration, and technical engineering support to JFCs (e.g., advanced base master planning, topographic engineering, force protection engineering, and cold weather mobility).

- The control and timely use of various funding sources is paramount to the effective use of contracting in support of joint operations. The Army, Navy, and Air Force can provide contract administrative teams consisting of both civilian and military personnel to provide construction contract support to the joint force. Contracting officers should be deployed early in support of a joint operation to initiate necessary contracts with US-based, HN, or other contractors in the operational area.

7. Real Estate

The JFC should establish real estate acquisition policies and programs in support of the contingency operations. **Real estate operations involve the acquisition, management, and disposal of land and facilities to support joint operations.** The JFC determines what real estate is needed to satisfy operational requirements. Acquisition of land and facilities not owned by the USG is accomplished through assignment, international agreements such as SOFAs, memoranda of agreement, leasing from the HN, or direct leasing from the private sector. Within the Department of Defense, the Secretaries of the Military Departments are authorized to acquire by lease in foreign countries structures and real property relating to structures that are needed for urgent military purposes (see title 10, USC, section 2675). Real estate planning should be initiated as contingency plans are developed to identify land and facility requirements that are needed in support of joint operations. Real estate acquisition requires special contracting

procedures that are performed by USACE, NAVFACENGCOM, or a designated executive agent. Deployment of real estate personnel is essential early in an operation to ensure that needed land and facilities are acquired in a timely manner.

8. Civil Augmentation Programs

Civil augmentation programs such as LOGCAP, CONCAP, and AFCAP can provide worldwide logistic and construction support. Civil augmentation programs can play a significant role in mission accomplishment by providing the JFC and joint force engineer with additional options and flexibility in achieving timely civil engineering and logistic support. **Civil augmentation programs are managed by a contract agent and are structured with one contractor responsible for providing support that effectively integrates construction, facility maintenance, and logistic support to the joint force.** For example, within an operational area, subcontractors, materiel, and personnel may come from many countries within the region. A single contractor prevents multiple agencies and their contractors from bidding against one another for services and materiel in the operational area. Use of civil augmentation programs requires planning and operational oversight as well as quality control and assurance to ensure that costs are effectively controlled, while support is provided consistent with the JFC's concept of operations.

a. **Army.** LOGCAP is an Army program funded in peacetime as a component of Army readiness. LOGCAP is a broad logistic and engineering contingency support contract that encompasses all Army preplanned contingency contracts and contingency components of contracts. Currently, LOGCAP is a cost-plus award fee contract, managed by the US Army Materiel Command (USAMC). **An important aspect is that in peacetime, the LOGCAP contractor maintains an on-call, preplanned, ready capability.** The contractor demonstrates readiness through the development of a worldwide plan, supporting plans to OPLANs, specific regional plans, and participation in exercises.

- **USAMC Support Contract.** The USAMC support contract provides both engineering, construction and general logistic services. USAMC is supported by USACE for engineering and construction contract administration and by the Defense Contract Management Agency for logistic services contract administration.

- **LOGCAP Support Contract.** In the operational area, the USAMC Logistics Support Element, who is subordinate to the senior Army logistics commander in the operational area, manages the contract. The contract can support all DOD components and missions and is a cost-plus award fee service contract that provides support to the joint force in three major areas:

  - Facilities repair and construction;

  - Base operations and maintenance; and

  - Logistic services.

b. **Navy.** The Navy's CONCAP program is a cost reimbursable contract administered by the Atlantic Division, NAVFACENGCOM. The contractor is usually a large construction firm, joint venture firm, etc., with international capability. **The contract offers responsive engineering and construction capabilities for a wide range of construction missions.** CONCAP was used for engineering fieldwork in Bosnia and for disaster response and recovery for Hurricane Bertha at Camp Lejeune. This construction-oriented contract

may be used worldwide, including CONUS. Major capabilities include the following:

- Engineering, design, and construction of the following:
  - •• Airfield and port facilities — piers and dredging;
  - •• Roads, bridges, ordnance facilities, and land fills;
  - •• Power plants and utility systems;
  - •• Communication and supply systems; and
  - •• Medical and enemy prisoner of war facilities.
- Operation of the following:
  - •• Facilities and utilities;
  - •• Billeting, food services, and recreation; and
  - •• Waste management — refuse and sanitation.

c. **Air Force.** AFCAP is a cost-plus award fee contract established as a force multiplier to augment civil engineer and services capabilities to support worldwide contingency planning and deployment operations. The AFCESA at Tyndall Air Force Base, Florida, manages AFCAP. AFCAP may augment a base sustaining force at any Air Force base where civil engineer and services forces have been deployed. Furthermore, AFCAP can provide construction support at existing overseas locations and can support base recovery operations as a result of natural disasters, accidents, or terrorist attacks. Major capabilities include the full scope of civil engineer capabilities and logistics, with the exception of EOD and flightline crash fire rescue operations, to include the following:

- Professional engineering services and infrastructure support, including architectural and engineering design, maintenance, repair, and construction.
- Emergency management, structural fire protection, facility hardening, dispersal, obstacles, redundancy measures, reconstitution of assets, and non-environmental site restoration.
- Environmental management services including permits and hazardous materials and/or waste management and disposal.
- Services capabilities and logistics, with the exception of mortuary affairs and field exchange, to include food service, troop support, lodging, laundry, fitness, and recreation.

Intentionally Blank

CHAPTER VI
ENVIRONMENTAL CONSIDERATIONS

"By maintaining compliance with all environmental standards, we ensure our access to training and operating ranges on land, in the air, and at sea. We recognize that many of our actions, whether it is to train new Sailors or Marines, maintain readiness of combat forces, or test new weapon systems have an impact on the natural environment. We need to understand those impacts, and take appropriate actions to minimize them. Beyond the strict interpretation of the law, we have an ethical responsibility to conserve the natural resources entrusted to us."

Robert Pirie, Jr.
Assistant Secretary of the Navy (Installations and Environment)

1. General

While complete protection of the environment during military operations may not always be possible, **planning should carefully address environmental considerations in joint operations**. This chapter defines roles and responsibilities. It generally organizes environmental requirements that a commander must meet as domestic and foreign, although it must be remembered that most domestic environmental requirements do not apply outside the United States. The aim of this chapter is to make environmental considerations part of a commander's planning process. **Environmental considerations include the spectrum of environmental media, resources, or programs that may impact on, or are affected by, the planning and execution of military operations.** Factors may include, but are not limited to: environmental compliance, pollution prevention, and conservation; health of personnel and protection of historical and cultural sites; and protection of flora and fauna.

2. Environmental Roles and Responsibilities

a. **Combatant Commander and Subordinate Joint Force Commander.** The combatant commander and subordinate JFC are responsible for protecting the environment in which US military forces operate to the greatest extent possible consistent with operational requirements. **JFCs should demonstrate proactive environmental leadership during all phases of joint operations across the range of military operations.** JFCs should instill an environmental ethic in subordinate commands and promote environmental awareness throughout the joint force. JFCs should ensure that environmental considerations are an integral part in the planning and decisionmaking processes. JFCs should identify specific organizational responsibilities and specific joint force environmental requirements. These responsibilities should have clearly defined goals, strategies, and measures of success. JFCs should ensure compliance, as far as practicable within the confines of mission accomplishment, with all applicable domestic environmental laws, relevant country-specific Final Governing Standards (FGS), or the DOD Overseas Environmental Baseline Guidance Document (OEBGD), and relevant international agreements, "Environmental Considerations" annexes to relevant OPLAN, OPORD and/or other operational directives, and other environmental requirements that apply to the operation. The goal of compliance is to minimize potential adverse

impacts on human health and the environment while maximizing readiness and operational effectiveness.

b. **Combatant Command and Subordinate Joint Force Engineer.** The combatant command and subordinate joint force engineer are responsible for providing guidance to the combatant commander and/or subordinate JFC on environmental considerations in planning and executing joint operations. The combatant command and subordinate joint force engineer and staff develop and assist in the implementation of policies, procedures, and practices of the "Environmental Considerations" annex to an OPLAN and/or OPORD.

For additional information, refer to Annex L, Environmental Considerations, to CJCSM 3122.03A, Joint Operation Planning and Execution System Vol. II: (Planning Formats and Guidance).

c. **Combatant Command and Subordinate Joint Force Staff Judge Advocate.** The combatant command and subordinate joint force SJA advise the commander and staff on compliance with environmental laws, regulations, treaties, conventions, and SOFAs and their potential impact on operations. Specifically, the combatant command and subordinate joint force SJA **are responsible for legal support in the development of the "Environmental Considerations" annex to an OPLAN and/or OPORD to ensure that legal requirements related to environmental considerations are incorporated as appropriate**. The joint force SJA assists other members of the joint force staff (e.g., joint force J-4) and defense agencies in negotiating transit agreements in advance of the actual deployment, to permit the transit of regulated (hazardous) wastes to effect their disposal in an environmentally sound manner. The joint force SJA helps determine baseline environmental survey requirements and processes civilian claims resulting from environmental damage. The joint force SJA should participate in the development of any baseline environmental survey exemptions.

d. **Combatant Command and Subordinate Joint Force Surgeon.** The combatant command and subordinate joint force surgeon are responsible for health services support (e.g., preventive medicine and occupational health) to the joint force with priorities on water and wastewater, including water vulnerability assessment support, sanitation, waste disposal (e.g., hazardous and infectious waste), health risk assessment (e.g., base camp site selection), environmental health sampling and surveillance, and vector control to protect human health and welfare.

e. **Joint Force Public Affairs Officer.** The joint force public affairs officer (PAO) coordinates with appropriate staff and commanders to plan and accomplish public relations efforts in support of mission objectives. Special attention should be given to potentially sensitive environmental issues associated with a joint operation. The joint force PAO will be a significant participant in public outreach efforts. The joint force PAO should participate in development of and be aware of assigned responsibilities in environmental related contingency plans.

For additional information on other joint force PAO responsibilities, refer to JP 3-61, Doctrine for Public Affairs in Joint Operations.

f. **Joint Force J-4.** The joint force J-4 or engineer is responsible for ensuring that wastes and effluents from operations and service functions are appropriately controlled. The joint force J-4 and staff are responsible for all aspects of HAZMATs and regulated (hazardous) waste management to include minimizing use, storage, transportation, disposition, and return to home station of

excess materials. The joint force J-4 and staff should coordinate closely with the joint force SJA in negotiating transit agreements and in establishing procedures for the turn-in of regulated (hazardous) wastes for proper treatment and disposal.

g. **Joint Environmental Management Board.** A JEMB may be established by the combatant commander or subordinate JFC for a joint operation in order to integrate the environmental protection efforts of all participating components under a single authority and to ensure unity of effort for environmental protection activities. The JEMB should normally be chaired by the combatant command or subordinate joint force engineer, and includes representatives from each Service component and joint force staff representatives as necessary (e.g., legal, occupational health, preventive medicine, safety, comptroller, planning, operations, and logistics). The JEMB should participate in the operation planning process by providing baseline environmental surveys and identifying exemptions and management requirements to the JFC. **The JEMB assists the JFC in establishing the joint force environmental policies, practices, procedures, and priorities and providing oversight of environmental protection standards and compliance.** Establishment of a dedicated and appropriately staffed environmental engineering staff and supported with expertise from other joint force staff members (e.g., legal and medical) may obviate the need for a JEMB in smaller operations.

h. **Unit Commanders.** Unit commanders are responsible for complying with the applicable environmental requirements established by the JFC in the "Environmental Considerations" annex of the OPLAN and/or OPORD. Unit commanders should keep the JFC and staff informed of conditions that may result in non-compliance or the potential for non-compliance with this annex.

i. **Unit Level Points of Contact.** Unit commanders should establish a unit level point of contact for communication of environmental information with the joint force engineer and/or JEMB, as required. The unit level point of contact should be the unit commander's advisor on environmental considerations.

j. **Other Governmental Agencies or Nongovernmental Organizations.** During operations, such as those involving responses to disasters or support to civilian governmental agencies (e.g., cleanup of major oil or hazardous substance spills), the JFC may have to work with other governmental agencies or NGOs to ensure successful completion of the operation. Where appropriate, these representatives should be a part of the environmental planning process. The JFC may also consider their participation as ad hoc members of the JEMB.

3. Environmental Requirements

In general, **environmental requirements can be divided into overseas requirements and requirements applicable in the United States, its territories, and possessions**, although some US environmental requirements may have extraterritorial application. For example, Executive Order (EO) 12114, *Environmental Effects Abroad of Major Federal Actions*, establishes requirements for the conduct of environmental studies for activities conducted overseas, somewhat similar to the environmental analysis requirements regarding operations conducted within the United States mandated by the National Environmental Policy Act (NEPA). The joint force SJA should be consulted to determine extraterritorial applicability.

a. **Requirements Applicable Within the United States. All joint operations within the United States and its territories and possessions will be conducted in compliance**

with applicable federal, state, or local environmental laws and regulations. NEPA requires environmental planning for major federal actions that have the potential for a significant environmental impact. It requires that commanders make environmental considerations an integral part of the mission planning and decisionmaking process. NEPA mandates procedures for environmental planning, but does not mandate decisions. Other federal statutes such as the Clean Water Act, Clean Air Act, Resource Conservation and Recovery Act, and the Comprehensive Environmental Response, Compensation, and Liability Act establish environmental requirements that may impact on joint operations. These statutes remain applicable during joint operations including MOOTW and war. Many US environmental laws allow for national security exemptions for specified activities, but only upon action by the President. These exemptions are rarely granted and should be coordinated up the chain of command before they are relied upon.

b. **Requirements Applicable in Overseas Areas. All joint operations in overseas areas (areas outside US territory) will be conducted in accordance with applicable treaties, conventions, international agreements (to include basing agreements), FGS or the OEBGD, unified combatant command directives, "Environmental Considerations" annex of the OPLAN or OPORD, and other environmental requirements that apply to the operation.** In the absence of definitive environmental guidance within applicable international agreements, geographic combatant commanders and subordinate JFCs should establish guidance in the OPLAN and/or OPORD that will protect force health, limit adverse public health impacts, consider the US liability, and be consistent with mission goals. In addition to requirements contained in international agreements, the following references provide guidance and requirements that may impact joint operations beyond US territory and, as appropriate and applicable, should be considered in developing the "Environmental Considerations" annex to an OPLAN and/or OPORD.

- **DODD 6050.7, *Environmental Effects Abroad of Major Department of Defense Actions.*** This directive implements EO 12114, *Environmental Effects Abroad of Major Federal Actions*, provides definitions of key terms, establishes review procedures, and describes documentation requirements for the environmental impact analysis process. DODD 6050.7 provides specific categorical exclusions and general exemptions for procedural and other requirements in conducting environmental assessments (e.g., actions taken by or pursuant to the direction of the President or a cabinet officer when the action occurs in the course of armed conflict).

- **Department of Defense Instruction (DODI) 4715.5, *Management of Environmental Compliance at Overseas Installations.*** This instruction establishes environmental compliance standards for protection of human health and the environment at DOD installations in foreign countries and provides for designation of DOD environmental executive agents (EEAs). DODI 4715.5 requires development and maintenance of an OEBGD. DODI 4715.5 does not apply to off-installation operational and training deployments. However, the OEBGD may be a valuable source and reference document for the development of additional environmental standards for joint operations.

- **DODI 4715.8, *Environmental Remediation Policy for DOD Activities Overseas.*** This instruction implements policy, assigns responsibilities, and prescribes procedures for remediation of environmental contamination on or away

from DOD installations or facilities that was caused by DOD operations outside the United States. DODI 4715.8 does not specifically apply to operations connected with actual or threatened hostilities, security assistance programs, peacekeeping missions, or relief operations. However, it may provide valuable information that could be used in operational planning.

- **Naval Warfare Publication 4-11, *Environmental Protection*.** This publication provides guidance to Navy operational commanders and their staffs for maritime operations during peacetime, MOOTW, and war. It provides guidance on the development of the "Environmental Considerations" annex to an OPLAN and/or OPORD.

- **Air Force Handbook 10-222, Volume 4, *Environmental Guide for Contingency Operations*.** This handbook presents practices that can minimize adverse impacts to human health and the environment and facilitate compliance during contingency operations. These strategies are designed to reduce or eliminate negative impact on mission accomplishment caused by health hazards and regulatory non-compliance. It outlines these strategies for exercises, deployments, MOOTW, and armed conflict within the United States, at overseas DOD installations, and at overseas non-DOD installations.

- **Army Field Manual 3-100.4 and Marine Corps Reference Publication 4-11, *Environmental Considerations in Military Operations***, provides guidance in applying appropriate environmental protection procedures during military operations.

c. **HNS Agreements and SOFAs.** These are bilateral or multilateral agreements that affect the conduct of military operations within HNs. Although in the past these agreements have not always addressed environmental protection, HNs have recently reflected greater concern with environmental issues associated with military operations within their borders. Joint forces are expected to comply with these agreements.

d. **The Overseas Environmental Baseline Guidance Document and Environmental Final Governing Standards.** The OEBGD specifies criteria and management practices for environmental compliance at DOD installations at overseas locations. It is designed to protect human health and the environment and reflects generally accepted environmental standards applicable to DOD installations, facilities, and actions in the United States. It also incorporates requirements of US law that apply to DOD installations and activities outside the United States and its territories. **Designated DOD EEAs** (See Attachment 3 to DODI 4715.5, *Management of Environmental Compliance at Overseas Installations*) **use the OEBGD to develop and update country-specific FGSs for all DOD components**. To develop and update the FGS, the EEAs compare OEBGD standards with the requirements of applicable international agreements (e.g., SOFAs) and relevant local, regional, and national HN standards. The EEAs normally incorporate in the FGSs those standards that provide more protection to human health and the environment. The OEBGD applies in countries where no FGSs have been established. Neither FGSs nor the OEGBD apply to the operations of US military vessels, the operations of US military aircraft, or to off-installation operational and training deployments. The FGSs or the OEBGD in countries where no FGSs exists does apply to support functions for US military vessels and aircraft. Although the OEBGD and FGSs are not applicable to the operation of US military vessels, the operations of US military aircraft, or to off-installation operational and training

deployments, they provide valuable information for environmental planning and can aid the conduct of joint operations.

e. **International Regulations, Treaties, and Conventions.** An increasing number of environmental international regulations, treaties, and conventions apply to joint military operations. For example, management and processing of hazardous wastes for disposal overseas may be affected by the Basel Convention, an international agreement governing the transboundary shipment and disposal of hazardous wastes. Another international convention that may impact a joint operation is the London Dumping Convention that precludes the dumping at sea of wastes generated ashore. Maritime operations will be affected by the International Maritime Convention for the Prevention of Pollution from Ships. The JFC should consult the joint force SJA regarding these requirements and their potential impact on operations.

f. **Law of Armed Conflict.** The law of armed conflict is derived from customary international and treaty law. It establishes certain limits on the means and methods of warfare that could impact upon civil engineering operations. JP 3-60, *Joint Doctrine for Targeting*, addresses how the principles in the law of armed conflict are to be observed to minimize environmental damage and to protect civilian populations. The joint force SJA can provide specific advice on the applicability of the law of armed conflict.

4. Environmental Planning

a. **Need for Environmental Planning.** By considering environmental issues early during the planning process, the JFC may continue to achieve operational objectives while minimizing the impact on human health and the environment. **Failure to consider the environmental impacts of all activities may adversely affect the operation.** Potential effects include delaying operation commencement, limited future use of exercise or HN areas, and adverse public opinion, potentially impacting the success of an operation. Commanders should make environmental considerations an integral part of the mission planning and operational decisionmaking process. In joint operations, it is important that all Services implement these requirements in the same way.

The combatant commander and subordinate JFC develop and publish environmental policies and procedures in the "Environmental Considerations" annex to the OPLAN and/or OPORD that will minimize the impact of environmental health effects on an operation and the operational effects on the environment. By early assessment of environmental considerations, commanders may become aware of the potential environmental effects or impacts of mission accomplishment while alternatives still exist to address mitigating actions. By planning early, the JFC and joint force staff will be aware of the environmental requirements, and will be able to plan more efficiently and act accordingly. Furthermore, careful and visible attention to environmental considerations in the conduct of a military operation can assist in shaping a positive image both internationally and domestically.

b. **Elements of Environmental Planning.** The joint force staff should plan the operation to achieve mission objectives while minimizing the environmental effects and observing environmental requirements. Although not all of the following elements (see Figure VI-1) will be applicable to all operations (e.g., some, such as identification of alternatives to obtaining objectives, are not required for operations overseas), they may prove helpful during planning.

- Identification of operational objectives and the activities that are proposed to obtain these objectives, including

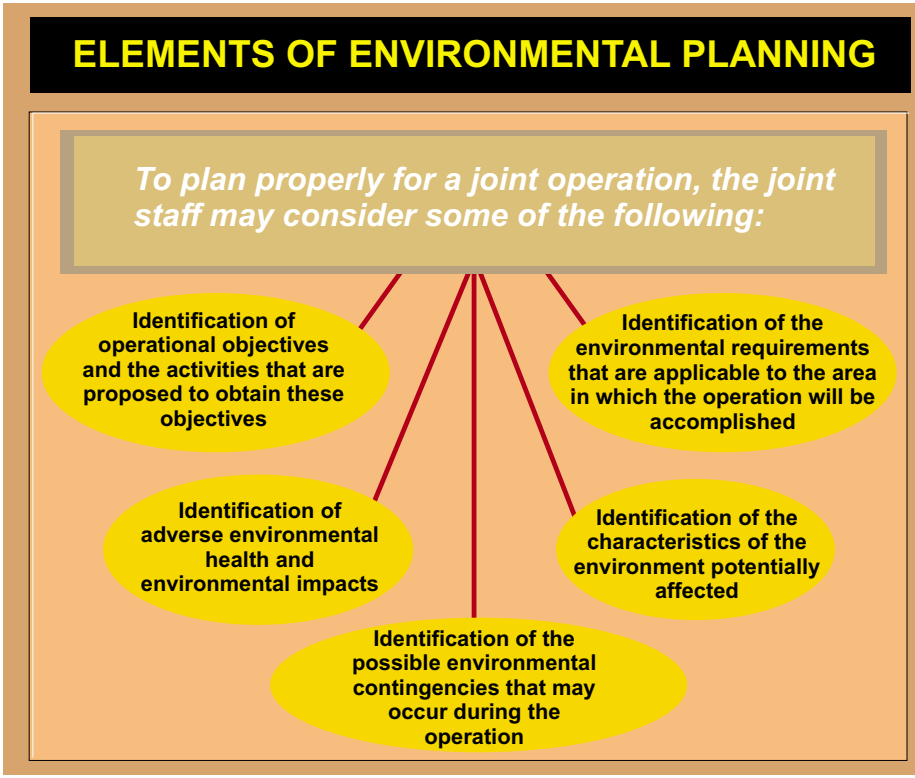


Figure VI-1. Elements of Environmental Planning

logistics and identification of HAZMATs that may be used.

- Identification of potential alternative means of obtaining operational objectives. Alternatives include such ideas as computer simulation or use of new technologies to minimize impact on the environment.
- Identification of the environmental requirements that are applicable to the operational area.
- Identification of adverse environmental health and environmental impacts that may result from conducting the operation.
- Establish formal relationships and coordination with other disciplines that have roles in environmental planning and operations (e.g., medical and legal).
- Identification of the characteristics of the environment potentially affected.
- Identification of possible environmental contingencies that may occur during the operation, such as accidental spills. Determination of how the environmental contingency would affect the environment in the operational area and how it could be prevented or mitigated should it occur.
- Determination of the environmental and operational risk associated with the operation. If risks are unacceptable, identify alternatives that will mitigate associated risks.
- Negotiation of applicable agreements to allow for the unimpeded transit of hazardous materials or waste by military and contracted assets for

environmentally sound treatment or disposal.

- Determination of contractor status, to include privileges and immunities in support of the operation.

c. **Key Environmental Factors.** JFCs should consider environmental and force health protection during each phase of an operation. In planning and conducting joint operations, regardless of geographic location, commanders should give appropriate consideration to the following:

- Preexisting environmental conditions impacting site selection, environmental health vulnerabilities, and potential US liabilities associated with the operation.
- Ensure a predeployment site assessment is performed. Military preventive medicine personnel, part of the initial deployment team on site, will perform an Environmental Baseline Survey to document the occupational and environmental health status of a beddown location.
- Air emissions.
- HAZMATs, including pesticides.
- Hazardous waste. Appropriate disposition could include recovery, treatment, or disposal within the operational area or, where necessary, transit to another country for these purposes.
- Oil and hazardous substance spills prevention, control, and response training.
- Medical and infectious waste.
- Solid waste.
- Water and wastewater, to include sanitary wastewater.
- Natural resources to include endangered or threatened species and marine mammals.
- Historic and cultural resources.
- Noise abatement.
- Resource and energy conservation through pollution prevention practices.
- Camp closure and site cleanup prior to redeployment.
- Incident reporting and documentation of any cleanup action.
- Transportation of excess material and equipment from the tactical area in an environmentally sound manner. Contractors and contractor vehicles need to be assured of unhindered transit of international borders.

d. **Environmental Risk Management. Environmental risk management is the process of assessing, detecting, and controlling the environmental risk arising from operational actions and balancing environmental risk with mission benefits and gains.** Knowledge of the environmental factors is key to planning and decisionmaking. With this knowledge, leaders can promote operational success, quantify environmental risks, detect problem areas, reduce the possibility of injury or death to military personnel and affected civilian populations, reduce property damage, and ensure that operations are consistent with environmental requirements. The JFC should integrate environmental risk management into the overall planning of operations.

5. Environmental Contingencies

a. **Oil and Hazardous Substance Spills.** The laws and policies that control oil and hazardous substances protect water, soil, and air from harmful levels of contamination. **Joint forces should ensure that they minimize environmental contamination from oil and hazardous substances.** The combatant commander and/or subordinate JFC should complete an oil and hazardous substance spill contingency plan for an operation as part of the "Environmental Considerations" annex to an OPLAN and/or OPORD prior to commencing joint operations. Spill contingency plans should address prevention procedures and practices, spill reporting, initial control and recovery actions, cleanup actions, and C2 responsibilities. The plans should also address availability and location of equipment (e.g., personal protective equipment) for control and cleanup, safety and health of personnel, and training.

b. **Environmental Non-Compliance.** During an operation, environmental non-compliance may occur due to machinery and equipment breakdown or malfunction, enemy actions, or the inadvertent or willful disregard or violation of environmental requirements by operating force personnel. Failure to take prompt and appropriate action may endanger human health and exacerbate the consequences of the incident. The "Environmental Considerations" annex to an OPLAN and/or OPORD should address such environmental contingencies, including reporting requirements.

Air Force fire protection personnel responding to a simulated HAZMAT fire.

Intentionally Blank

APPENDIX A
ENGINEERING UNITS OF THE ARMY

1. General

Army engineers operate as an integral member of the joint force to provide a full range of engineering capabilities to the JFC across the full range of military operations. Army engineers execute mobility, countermobility, and survivability (M/CM/S) missions and provide general engineering throughout the operational area as well as providing terrain analysis, terrain visualization, and special map products. This appendix addresses Army engineer organizations that have the capability to support general engineering operations.

2. Engineer Command

The engineer command (ENCOM) is normally assigned to an Army component command. It provides the following:

a. Commands, controls, supervises, coordinates, and performs operational planning for assigned or attached engineer brigades, groups, and other units engaged in operational M/CM/S, construction, and topographic engineering operations.

b. Plans and coordinates troop construction support and support to the Army, other Services, and allies throughout the operational area.

c. Allocates engineer troops, materials, and equipment to construction projects.

d. Provides guidance and technical assistance to units engaged in construction projects.

e. Coordinates topographic and military geographic intelligence support to the Army service component command (ASCC).

3. Engineer Brigade (Echelons Above Corps or Army-Level)

This brigade is normally assigned as ASCC and may be attached to an ENCOM. Utility teams normally augment the capabilities of this unit when facilities engineering support is required. The engineer brigade (echelons above corps (EAC) or Army-level) provides the following:

a. Commands, controls, conducts planning for, and supervises attached engineer units that are engaged in CS and constructing and/or rehabilitating facilities.

b. Allocates resources in support of engineer operations.

c. Supervises engineer units that are constructing and rehabilitating roads, structures, air-landing facilities, and petroleum storage and distribution facilities.

d. Supervises HN personnel and administers contractual construction and labor.

4. Engineer Brigade (Corps)

This brigade is normally assigned to a corps. This unit provides the following:

a. Commands and controls assigned and attached units.

b. Plans and coordinates the operations of the engineer units that are engaged in CS and constructing and rehabilitating facilities in support of the corps.

c. Allocates units and resources in support of engineer operations.

d. Plans and monitors the activities relating to M/CM/S operations.

e. Supervises indigenous personnel and administers contractual construction and labor.

f. Provides an engineer staff element to the corps headquarters (HQ).

g. Plans and supervises terrain-intelligence and topographic engineering operations.

5. Engineer Group (Construction)

This unit is normally assigned to an operational area engineer brigade and/or an ENCOM. It commands assigned and attached units and coordinates engineer activities. Because this HQ possesses a design and management section for specific engineering tasks at EAC, it can command, control, plan, and supervise the combat heavy engineer battalions' activities throughout the operational area. This unit provides the following:

a. Plans, supervises, and coordinates the activities of the assigned and attached engineer units engaged in M/CM/S and general engineering functions.

b. Supervises engineer units preparing and maintaining combat routes and MSRs (e.g., ingress and egress, battle positions, and river-crossing sites) and repairing bridges, fords, and culverts.

c. Plans and supervises engineer reconnaissance.

d. Conducts planning for and supervises assigned and attached engineer units performing general engineering tasks, such as constructing and repairing landing strips, heliports, port facilities, and railroads.

6. Engineer Group (Combat)

This unit is normally assigned to a corps when the composition of the subordinate battalions is predominately combat-oriented and attached to an engineer brigade. At EAC, this group HQ may have a greater construction orientation; yet it brings valuable combat expertise to the EAC's reinforcing role in areas with forward project zones. This unit provides the following:

a. Plans, supervises, and coordinates activities of assigned and attached engineer units engaged in M/CM/S and general engineering functions.

b. Supervises engineer units preparing and maintaining combat routes and MSRs (e.g., ingress and egress, battle positions, and river-crossing sites) and repairing bridges, fords, and culverts.

c. Plans and supervises engineer reconnaissance.

d. Conducts planning for and supervises assigned and attached engineer units performing general engineering tasks, such as constructing and repairing landing strips, heliports, port facilities, and railroads.

e. Does not have a design management section.

7. Engineer Battalion (Combat) (Heavy)

The battalion is normally assigned to an engineer group, a brigade, a corps, or a joint or combined task force. This unit can perform certain tactical missions as well as operational engineer missions throughout the operational area. It provides the following:

a. Increases the combat effectiveness of the division, corps, and Army forces in the

operational area by accomplishing general engineering and M/CM/S tasks.

b. Constructs, repairs, and maintains MSRs, landing strips, structures, and utilities.

c. Performs rear area operations, to include security operations and limited infantry combat missions, as required.

d. Repairs and reconstructs, on a limited basis, railroads and sewage and water facilities.

e. Provides field engineering assistance and support to divisional engineers preparing protective positions.

f. Conducts engineer reconnaissance.

g. Creates obstacles to degrade enemy mobility in rear areas.

h. Clears obstacles as part of an area clearance operation, not as part of an assault-breaching operation.

i. Supervises contractual construction, skilled construction labor, and unskilled indigenous personnel.

j. Conducts area damage clearance and restoration operations.

k. Major equipment systems within this battalion include bulldozers, scrapers, scooploaders, 5-ton and 20-ton dump trucks, compaction rollers, 25-ton cranes, and road graders.

8. Engineer Battalion (Prime Power)

Platoons and companies from the prime power battalion are normally in direct support or OPCON to the engineer HQ in the operational area, such as the ENCOM, or the engineer brigade (EAC or Army-level). The battalion provides the following:

a. Generates electrical power and provides advice and technical assistance on all aspects of electrical power and distribution systems in support of military operations.

b. Maintains the Army's power-generation equipment.

c. Distributes the Army's power-generation equipment war reserves.

d. Designs and constructs power plants and distribution systems for base camps.

e. Produces electrical power in support of C2 sites, hospitals, weapons systems, logistic support areas, tactical generators at fixed sites needing relief, and critical facilities.

f. Provides technical advice to commanders and senior engineers on all aspects of electrical-power systems.

g. Operates, maintains, and performs minor repairs to other electrical power-production equipment, including HN fixed plants.

h. Provides electrical engineering support, such as limited design and analysis capabilities.

i. Performs electrical surveys.

j. Assists representatives from the electrical-related contracting office.

k. Provides quality control for contractor designs and for constructing electrical power plants and power distribution systems.

l. Manages requirements and coordinates prime power assets worldwide.

m. Supports real property maintenance activities and power reliability and enhancement programs.

9. Engineer Combat Battalion (Corps) (Wheeled)

The battalion is normally assigned to a corps and attached to an engineer brigade or group. At EAC, the battalion adds combat skills and talents to the engineer structure much like the combat heavy battalion adds construction skills, expertise, and protection capability to the divisional structure. It provides the following:

a. Increases the combat effectiveness of the corps by accomplishing M/CM/S and general engineering tasks.

b. Reinforces divisional engineer units, when required.

c. Provides engineer support in assault river-crossing operations.

d. Performs rear area operations, to include security operations and limited infantry combat missions, as required.

e. Performs general engineering tasks (e.g., constructing, repairing, and maintaining landing strips, heliports, command posts (CPs), LOCs, tactical routes, culverts, fords, supply installations, buildings, and structures) and other related horizontal construction tasks, as required.

f. Provides technical advice, assistance, and training in mine warfare, field fortification, camouflage, demolition, and engineer reconnaissance techniques.

10. Engineer Company (Construction Support)

The company is normally assigned to an ENCOM for further attachment to an engineer brigade or group. It augments a combat heavy battalion to give it additional horizontal construction capability. The company normally does not perform construction independently. It provides the following:

a. Provides construction support, equipment, and personnel for rock crushing, bituminous mixing, paving, storage facilities, and airfields.

b. Provides support to one engineer brigade or group engaged in construction projects that:

- Require up to 75 tons per hour of crushed rock and sand from rock quarries and gravel pits for a two-shift operation.
- Require up to 75 tons per hour of washed and sized precrushed rock for a two-shift operation;
- Require up to 150 tons per hour of bituminous mixes and blends for paving projects for a one-shift operation; and
- Require equipment and operators to support selected construction for a two-shift operation and personnel with the capability of supervising contractual labor and indigenous personnel and assisting in the supervision of contractual construction.

11. Engineer Dump-Truck Company

The company is normally attached to an engineer brigade or group. It provides the following:

a. Operates dump trucks for moving bulk materials in support of other engineer units.

b. Provides a haul capacity of up to 600 tons of bulk material (e.g., gravel, earth fill, and crushed stone) per trip.

12. Engineer Pipeline-Construction Company

The company is normally assigned to an ENCOM and attached to an engineer brigade or group. It augments a combat heavy battalion to give it the capability to perform pipeline operations. The company normally does not perform construction independently. It provides the following:

a. Provides technical personnel and specialized equipment to assist military units or indigenous personnel in constructing, rehabilitating, and maintaining pipeline systems.

b. Provides advisory personnel to support up to three engineer companies constructing a pipeline (e.g., stringing and coupling pipe), a pump station, and a dispensing facility and erecting a storage tank.

c. Provides specialized tools, equipment, and personnel to operate on a two-shift basis.

d. Is capable of transporting 21,000 linear feet of 6-inch pipe, 16,200 linear feet of 8-inch pipe, or 9,000 linear feet of 12-inch pipe over unimproved roads in two lifts.

e. Constructs and rehabilitates pipeline systems, to include erecting storage tanks when construction units are available.

13. Engineer Port-Opening Company

The company is normally assigned to an ENCOM and may be further attached to an engineer brigade or group. It augments a combat heavy battalion to give it the specialized equipment required for port construction and repair operations. The company normally does not perform construction independently. It provides the following:

a. Provides specialized engineer support in developing, rehabilitating, and maintaining port facilities, to include JLOTS operations.

b. Constructs, rehabilitates, and maintains offshore facilities, to include mooring systems, jetties, breakwaters, and other structures required to provide safe anchorage for ocean-going vessels.

c. Constructs, rehabilitates, and maintains piers, wharves, ramps, and related structures required for cargo loading and offloading.

d. Constructs facilities for roll-on/roll-off, break bulk, and containerized cargo handling.

e. Maintains tanker-discharge facilities, to include repairing or replacing existing petroleum, oils, and lubricants (POL), jetties, and submarine pipelines.

f. Provides limited dredging and removes underwater obstructions.

g. Installs the OPDS in support of JLOTS operations where no naval units are assigned.

h. Provides operators for selected items of equipment for a two-shift operation.

i. Depends on the pipeline-construction engineer company for radiographic inspection of pipeline welds, when required, and the lightweight diving team for underwater construction, survey, reconnaissance, and recovery.

14. Engineer Company (Multirole Bridge)

The company is normally task-organized to a corps, divisional engineer battalion, or a combat engineer group to support bridging operations. It provides personnel and equipment to transport, assemble, disassemble, retrieve, and maintain all

standard US Army bridging systems. It provides the following:

a. Performs fixed bridging with the medium girder bridge (MGB). It maintains four MGB sets with sufficient components for the assembly of various spans and load classes of bridge. Under normal conditions, the sets provide four 31.1 meters (103 feet) Class 60 bridges (reinforceable to Class 70 with reinforcement kits) or two 49.4 meters (163 feet) Class 60 bridges (reinforceable to Class 70 with reinforcement kits).

b. Performs float bridging using the ribbon bridge. It maintains approximately 213 meters (700 feet) of Class 75 (tank) and Class 96 (wheel) float bridge, or 6 rafts of Class 75 (tank) and Class 96 (wheel) based on a 0 to 3 ft per second water velocity.

c. Has a secondary mission to provide transportation for a palletized loading system configured cargo.

15. Engineer Bridge Company (Panel Bridge)

The company is normally assigned to a corps and attached to an engineer brigade or group. It provides the following:

a. Provides personnel and equipment to transport, assemble, disassemble, and maintain engineer bridging.

b. Provides dump trucks for earthmoving and engineer-mission cargo hauling in emergencies by downloading bridge loads.

c. Provides one panel bridge set (Bailey), with sufficient components, and a cable reinforcement set for erecting bridges of various spans and load classes. The set includes two 24.4-meter (80 feet) double-truss, single-story (Class 50 wheeled/Class 60 tracked) bridges without a cable reinforcement set and one 58.5-meter (180 feet) triple-truss, single-story (Class 50 wheeled/Class 60 tracked) bridge with a cable reinforcement set. Additional bridge components for spans over 100 feet are available.

d. Provides technical supervision to assist other engineer units in bridge construction.

e. Constructs bridges in emergencies using organic personnel, but with increased construction times.

f. Provides 5-ton dump trucks for earthmoving and general engineering mission cargo hauling with a 150-ton capacity per trip when bridging is not loaded.

16. Engineer Bridge Company (Medium-Girder Bridge)

The company is normally assigned to a corps and attached to an engineer brigade or group. When task-organized to the ENCOM, the bridge company is normally attached to an engineer group to provide upgrades to tactical bridging for an increased sustainment-flow capability. It provides the following:

a. Provides personnel and equipment to transport, assemble, disassemble, and maintain engineer bridging.

b. Provides dump trucks for earthmoving and engineer mission cargo hauling in emergencies by downloading bridge loads.

c. Provides four MGB sets with sufficient components to assemble various spans and load classes of single- and double-story bridges. Under normal conditions, the sets include four 31.5-meter (103 feet) Class 60 bridges or two 49.6-meter (163 feet) Class 60 bridges with reinforcement kits.

d. Provides personnel and equipment to assemble two bridges simultaneously.

e. Provides technical supervision to assist other engineer units in bridge assembly and disassembly.

f. Provides 5-ton dump trucks for earthmoving and general engineering mission cargo hauling with a 150-ton capacity per trip when bridging is not loaded.

g. Provides personnel and equipment to load, transport, and advice on the erection of panel-bridging equipment, when required.

17. Engineer Company (Assault Float Bridge)

The company is normally assigned to a corps and attached to an engineer brigade or group. It provides the following:

a. Provides personnel and equipment to transport, assemble, disassemble, retrieve, and maintain the engineer assault float bridge at one or multiple bridge sites.

b. Provides engineer mission hauling of palletized cargo in emergencies by immobilizing bridge loads.

c. Provides about 213 meters (700 feet) of a Class 96 wheeled/Class 75 tracked float bridge or six Class 96 wheeled/Class 75 tracked rafts based on a 0 to 3 feet per second water velocity.

d. Conducts non-tactical bridging and rafting missions, as required.

e. Transports up to 560 tons of cargo in a single haul over highways and 280 tons of cargo in a single haul over unimproved roads and combat trails when the bridge load has been immobilized.

18. Engineer Company (Combat Support Equipment)

The company is normally assigned to a corps and attached to an engineer brigade or group. When assigned to the ENCOM, the company augments the horizontal equipment capabilities of the combat heavy battalions that are engaged in projects in the operational area such as airfields, logistic bases, or MSR maintenance. It provides the following:

a. Supports engineer combat operations within corps and division areas by conducting M/CM/S and general engineering tasks.

b. Provides engineer equipment to construct, rehabilitate, repair, maintain, and modify landing strips, airfields, CPs, MSRs, and LOCs.

c. Provides construction equipment support for divisional engineer battalions, when required.

d. Provides dump-truck support, when required.

19. Engineer Company (Light Equipment) (Airborne)

The company is normally assigned to a corps or another major tactical command and attached to an engineer brigade, battalion, or group. It provides the following:

a. Augments engineer operations and capabilities in support of light-force operations with engineer equipment.

b. Provides earthmoving equipment support in an airborne, air assault, airmobile, or light-force operation on a two-shift basis.

c. Provides a cross-country dump-truck capability of about 50 cubic yards or 45 tons per lift.

d. Can parachute or be air-delivered to work sites.

20. Engineer Company (Light Equipment) (Air Assault)

The company is normally assigned to a corps or another major tactical command and attached to an engineer brigade, battalion, or group. It provides the following:

a. Augments engineer operations and capabilities in support of light-force operations with engineer equipment.

b. Provides earthmoving equipment support in an airborne, assault, or light-force operation.

c. Provides a cross-country dump-truck capability of about 50 cubic yards or 45 tons per lift.

21. HQ Detachment, Engineer Battalion

The detachment is normally assigned to an engineer group or a brigade HQ at the corps or the EAC level. It provides the following:

a. Provides teams for the command, control, and administrative support of separate engineer companies and engineer teams organized under the 05-500 series.

b. Can provide command, control, and planning for three to seven companies and teams performing engineering tasks.

22. Engineer Team, Utilities

The team is normally attached to an engineer brigade or group or may be organized into an engineer-composite service unit. It provides the following:

a. Provides limited construction for specialized engineer support.

b. Provides limited facility engineering support in the areas of carpentry, masonry, electrical, plumbing, and road maintenance and repair.

23. Engineer Team, Fire-Protection HQ

The team provides C2 administrative support. One team can control three to seven fire-fighting teams. A team commander serves as the fire marshal of an installation or a facility or within an assigned operational area. A HQ team provides the following:

a. Plans for fire defense on an installation.

b. Conducts fire-prevention inspections.

c. Conducts fire investigations.

d. Establishes a fire-department communications network between the HQ, the military police, the airfield, and the fire-fighting teams.

e. Commands the fire-fighting teams.

f. Inspects and maintains fixed fire-protection systems on an installation and/or in the operational area.

g. Coordinates the resupply of fire-fighting assets, agents, self-contained breathing apparatus air, and fuel.

h. Coordinates mutual aid with other Services and/or HN fire-protection assets.

24. Engineer Team, Fire Truck

The team provides fire protection, administers first aid, provides an initial response to HAZMAT incidents, and implements a fire-prevention program. A commander's primary task list determines the team's assignments. A fire truck team provides the following:

a. Provides crash and rescue support for medical evacuation and normal flight or maintenance standbys.

b. Conducts fire-prevention inspections on an installation or airfield.

c. Provides C2 of the non-fire-fighting assets used to support natural-cover fire-fighting operations such as heavy equipment and personnel.

d. Conducts fire-fighting operations (e.g., structural, crash and rescue, and natural cover) on an installation and/or in an operational area.

e. Provides emergency medical assistance to victims.

f. Conducts an initial response to HAZMAT incidents.

g. Conducts the training of unit-level fire brigades.

h. Assists with medical resources during mass casualty incidents.

25. Engineer Team, Water Truck

a. The team transports water to resupply fire-fighting teams when a fixed water supply is not in place. It also supplies manpower to fire-fighting teams. One water truck team is assigned to each fire truck team. A water truck team provides the following:

- Conducts water-resupply support to fire-fighting teams.
- Provides additional manpower support to fire-fighting teams.
- Conducts reconnaissance of water-resupply points.
- Maintains the emergency water-supply points.

b. An aircraft crash and rescue team provides support to Army aviation and to Air Force, Navy, Marine Corps, allied, and civil aviation assets in support of Army operations. The types of support include search and rescue, emergency evacuation, forward arming and refueling point, and basic life support. The standard requirement for crash and rescue operations will be a minimum of one fire truck team and one water truck team. Aircraft that are over 10,000 pounds, have a normal fuel load over 400 gallons, or an average load of 12 or more persons will require two fire truck teams and one water truck team, at a minimum. Additional fire truck teams can be assigned, if available.

26. Engineer Team, Quarry

The team is normally attached or assigned to a fixed-strength unit or may be organized into an engineer composite unit. It provides the following:

a. Performs rock-crushing operations, which increases the capabilities of the construction group in major horizontal construction projects, such as roads, storage facilities, and airfields.

b. Provides personnel and equipment for a 24-hour period to operate the 150-tons per hour crushing plant and to issue its product to users.

c. Provides personnel and equipment for drilling and blasting operations that are required to produce raw stone for operating the 150-tons per hour crushing plant.

d. Is capable of hauling 80 tons of rock per trip from the quarry to the processing plant.

27. Engineer Team, Well Drilling

The team is normally attached to an engineer battalion (combat) (heavy). It provides the following:

a. Provides personnel and equipment for drilling and developing water wells.

b. Is capable of drilling and casting two complete water-well holes of 5 7/8 inches in diameter to a depth of 600 feet with organic equipment and up to 1,500 feet with additional drilling kit equipment.

c. Installs casings, screens, and pumps and develops the well to provide water at the wellhead.

28. Engineer Heavy Diving Team

The team is normally assigned to an ASCC and attached to an ENCOM to support commanders in ports, harbors, and coastal zones. It provides the following:

a. Assists in constructing port facilities, JLOTS structures, and floating barriers.

b. Repairs damaged piers, docks, wharves, seawalls, and breakwaters.

c. Clears underwater obstructions and marks navigational waterways.

d. Reduces and emplaces underwater obstacles and mines.

e. Reduces structures with underwater demolitions.

f. Recovers sunken material and vessels.

g. Installs and maintains vessel moorings.

h. Repairs Army lighters and vessels.

i. Installs and maintains the underwater portion of off-shore petroleum and water-distribution systems.

j. Protects land forces, vessels, and underwater structures from underwater threats, reducing the probability of underwater structural damage.

29. Engineer Light Diving Team

a. The team is normally assigned to a corps and attached to an engineer brigade or group. It provides the following:

- Provides near-shore and far-shore river-crossing-site reconnaissance and marks and prepares landing sites, riverbanks, and exit routes for crossing forces.
- Emplaces and reduces underwater obstacles and mines.
- Reduces structures with underwater demolitions.
- Collects underwater terrain data.
- Repairs damaged bridges, locks, dams, pipelines, canals, and levees.
- Constructs underwater bridge structures, obstacles, and floating barriers.
- Recovers submerged weapons systems.

- Protects land forces, river-crossing equipment, and underwater structures from underwater threats and deceives enemy forces of friendly underwater and waterborne intentions.

- Clears and marks inland navigational waterways.

b. The light team should be capable of supporting the heavy diving team in ports, harbors, and coastal zones; however, it will lack the heavy salvage and diving equipment required to perform salvage and continuous deep-sea diving operations.

30. Engineer Team, Real Estate

The team is normally assigned or attached to an ENCOM or may be organized into an engineer composite service unit. It provides the following:

a. Prepares all paper work incidental to acquisition and disposal of real property for military purposes.

b. Inventories and records installed and personal property located on installations.

31. Facilities Engineering Team

The facilities engineering (FE) team is a reserve unit with specific installation responsibilities. In times of national emergencies and contingency operations, it may be mobilized and attached to either an Army component command, a theater support command, an area support group, a corps HQ, or a staff element within the joint force HQ. When three or more FE teams are operating in a operational area, an engineer support group is usually formed. It provides an additional depth of FE capability and it has C2 over its assigned teams. The engineer support group has the capability to perform the same missions as the FE teams. The group provides the following:

a. Manages engineer resources in support of facility and civil engineering, performs master planning, and allocates resources, to include inspecting facilities; identifying, prioritizing, and conducting work; planning boards; and developing facility and civil-engineer projects.

b. Manages real property and can control real estate engineer teams and coordinate their activities.

c. Manages housing and space use.

d. Manages the environmental compliance and prevention programs in the operational area, to include environmental compliance assessments, recommendations for corrective actions, and proper reporting.

e. Performs limited design, to include preparing drawings, specifications, and cost estimates in support of facility and civil engineer projects.

f. Reviews the designs of contract architects and engineers to ensure that they conform to the user's requirements, mission, and codes.

g. Manages utilities services, maintenance, and repair efforts and can control engineer utility teams and coordinate their activities.

h. Inspects and ensures that the quality standards of construction projects by contract or troop labor are met.

i. Manages base operations, to include sanitation and landfill operations and can control fire-fighting and utility teams and coordinate their activities.

j. Can perform limited supervision of troop labor and indigenous personnel.

k. Manages facility-engineering supplies through assigned units.

32. Engineer Battalion (Topographic)

The battalion is normally assigned to an ENCOM or an ASCC. It provides the following:

a. Provides C2 and support for topographic units in the operational area, including the engineer topographic company at EAC.

b. Provides engineer topographic support to elements in the operational area.

c. Collects, analyzes, manages, and disseminates topographic information.

d. Maintains topographic databases.

e. Produces map updates, substitutes such as image maps, and supplements; overlays; and digital topographic data.

f. Provides terrain analyses and related products.

g. Collects, prioritizes, and coordinates all topographic production requirements in the operational area.

h. Performs topographic surveys and provides survey information to the elements in the operational area.

i. Stores and distributes special topographic products that the company, under C2 of the topographic battalion, produces.

j. Requisitions, stores, and distributes topographic technical supplies for units in the operational area (authorized stockage list in the operational area).

k. Maintains liaison with allied topographic units, NIMA, and appropriate staff elements of support units.

l. Depends on a quartermaster map-distribution platoon for the storage and the distribution of standard mapping products and the operation of map depots.

33. Engineer Company (Topographic)

The company is normally assigned to an ASCC. It provides the following:

a. Provides topographic engineering support to EAC.

b. Compiles controlled, semi-controlled, and uncontrolled image maps and mosaics.

c. Revises existing topographic data products within its capabilities.

d. Drafts special maps, overprints, overlays, and other topographic products.

e. Reproduces limited copies of monochrome and multicolor maps, map substitutes, overlays, overprints, and other topographic products.

f. Provides terrain-analysis products.

g. Performs topographic surveys and provides survey information to the EAC.

h. Interprets and measures remote-sensed imagery.

i. Extends horizontal and vertical controls into corps and division areas.

j. Stores and distributes special topographic products that the company produces.

k. Provides a survey information system and maintains digital point-positioning databases.

34. Engineer Company (Topographic) (Corps)

The company is normally assigned to an ASCC engineer battalion (topographic). It provides the following:

a. Provides topographic engineer support to the corps.

b. Compiles controlled and uncontrolled photomaps and mosaics.

c. Revises existing maps and other topographic data within its capabilities.

d. Produces special maps, overprints, overlays, and other topographic products.

e. Reproduces limited quantities of monochrome and multicolor maps, map substitutes, overlays, overprints, and other topographic products.

f. Provides terrain-analysis products.

g. Performs topographic surveys and provides survey information.

h. Interprets and measures remote-sensed imagery.

i. Extends horizontal and vertical controls into corps and division areas.

j. Stores and distributes special topographic products that the company produces.

k. Provides a survey information system.

l. Collects, manages, controls, and distributes the EAC digital topographic database.

35. Engineer Team, Topographic Planning And Control

The team is normally assigned to an ASCC. It provides the following:

a. Coordinates the activities of and performs topographic operational planning for units and agencies engaged in producing and supplying military geographic information and topographic products to the ASCC.

b. Determines the requirements and provides the programs for and the coordination of engineer topographic units assigned or attached to the operational area.

c. Coordinates with the NIMA, the host and/or allied nations' topographic support activities, and the higher HQ to accomplish the mission.

For additional information on Army engineering units, refer to Field Manual (FM) 3-34.230, Topographic Operations, *FM 5-100,* Engineer Operations, *and FM 5-116,* Engineer Operations: Echelons Above Corps.

Intentionally Blank

APPENDIX B
ENGINEERING UNITS OF THE NAVY

1. General

The NCF, known as the SEABEEs, are deployable Naval engineering units whose primary mission is to provide responsive contingency construction support for US military forces in the operational area. The common thread that is woven throughout all SEABEE units is responsiveness and flexibility.

a. NCF SEABEE units are organized under two Naval construction brigades that include both active and reserve units. They are administrative control (ADCON) to the naval component commander of their homeport geographic CINC. When deployed during peacetime their OPCON chain normally falls under the theater naval component commander. During contingencies when NCF SEABEE units deploy to support Marine forces, their OPCON chain falls under the theater Marine forces component commander.

b. ACBs are organized under two naval beach groups (NBGs) which fall under the Atlantic/Pacific Surface Forces. The NBGs are OPCON and ADCON to the Atlantic and Pacific Fleets. Like the NCF SEABEEs, OPCON is normally chopped to the theater CINC and delegated to the Naval Component Command in which the units are deployed.

c. The NCF is organized, trained, and equipped to construct, maintain, operate, and repair advanced bases and their associated logistic pipelines. The force also provides disaster control and relief assistance, and performs civic action projects to complement military or other national programs. NCF units are organized for quick and effective response as required by planning assumptions and guidance. When directed, SEABEE forces are transferred to the combatant command (command authority) of the combatant commander.

d. SEABEE resources are continually forward-deployed to provide quick response to any location where a contingency may occur. The forward-deployed presence of SEABEE resources minimizes lift requirements and ensures prompt engineering support to the commanders. The following SEABEE units make up the NCF.

- Naval construction brigade (NCB).
- NCR.
- NMCB.
- Construction battalion maintenance unit.
- Construction battalion unit (CBU).
- UCT.
- Naval construction force support unit (NCFSU).
- ACB.

2. Naval Construction Brigade

The NCBs provide forces to fulfill operational requirements of a combatant commander. There are two active NCBs. The NCB commander normally exercises C2 over two or more construction regiments. The NCBs are deployable, but rely on subordinate units for tactical and logistic support. When deployed, NCB personnel can perform limited work in an NBC environment, possessing individual personal protective gear.

3. Naval Construction Regiment

The NCRs, both active and reserve, act as C2 elements for subordinate NCF units and report to the NCBs. In the active forces, there are two deployable NCRs and two homeport training and logistic support NCRs. The homeport regiment primarily functions as a planning, training, and oversight group, and is subordinate to the NCB exercising OPCON of NCF units. The homeport NCR performs administrative, training, project tasking, and logistic support functions for NCF units. The logistic support provided by the homeport NCR includes planning for and movement of personnel.

4. Naval Mobile Construction Battalion

The NMCB's primary mission is expeditionary construction of advanced base facilities in support of the Navy, Marine Corps, other US Armed Services, and allied and coalition partners engaged in military operations. NMCBs construct base facilities and troop beddown; install, repackage and redeploy Bailey and medium girder bridges; and conduct defensive combat operations as required by the operational commander. Additional functions include repair, maintenance, and construction of shore facilities and LOCs during contingency, emergency, or disaster recovery operations. NMCBs are operationally self-sustainable for up to 60 days, requiring only replenishment of consumables. They are capable of limited operations in an NBC environment, possessing individual personal protective gear, limited chemical and radiological detection equipment and decontamination apparatus capable of decontamination of facilities and equipment organic to the unit. Each battalion is organized into one headquarters and four construction companies. Other configurations of the NMCB's manpower and equipment, such as that pre-positioned on the MPF ships, have been tailored to meet various missions. An NMCB can task-organize and deploy away from its mainbody a number of detachments, details, and teams depending on the operational tasking and theater requirements. An NMCB can organize and deploy the following standard organic detachments and teams.

a. **Air Detachment.** A readily deployable (within 48 hours), self-sustainable, company sized detachment, completely air transportable via C-130 lift, with a minimum of 89 personnel and 300 short tons of supplies and equipment. The unit is capable of sustained operations in a contingency or wartime environment for 30 days without re-supply except for consumables. The air detachment's primary mission is to repair war damage and construct urgent projects required by OPLANs and/or OPORDs during early stages of a contingency operation.

b. **Reinforced Air Detachment.** The reinforced air detachment includes two additional platoons and is capable of providing increased construction and engineer support, tailored to the operational scenario.

c. **Operations Detachment.** The operations detachment is a reinforced company-size detachment deployed from the main body of the NMCB to perform light to medium construction and engineer support.

d. **Reinforced Operations Detachment.** The reinforced operations detachment is expanded to two companies in strength and is capable of providing increased construction and engineering support, tailored to the operational scenario.

e. **Limited Operations Detachment.** The limited operations detachment is smaller, typically platoon-sized, deployed from the NMCB, and able to perform light construction and engineering support.

f. **Engagement Team.** The engagement team is a squad-sized detachment deployed from the NMCB for task-specific light construction projects that are accomplished within 30-120 days.

g. **Training Team.** The training team is a fire team-sized detachment deployed from the NMCB to provide training and oversight of task-specific construction and engineering projects performed by others.

h. **Main Body.** The main body is the core of the deployed NMCB. The size of the main body ranges from 812 personnel at full wartime end strength and no detachments to as few as 250 personnel with all other NMCB personnel deployed with detachments.

i. **Maritime Pre-positioning.** Three NMCB tables of allowances (TOAs) (P25M) are configured for maritime pre-positioning within the three existing strategically deployed maritime pre-positioning ship squadrons (MPSRONs), in support of the US Marine Corps. Each TOA P25M is configured and spread-load on three ships within a squadron in support modules that can be deployed in various sizes. The modules are configured as follows: core, basic, and heavy. The core module contains enough supplies and equipment to sustain up to 250 SEABEEs ashore in support of a Marine expeditionary unit (MEU). The basic module contains additional vertical capability and could be added to the core module, should the mission require. The heavy module contains additional horizontal capability and can be added to any of the other core modules with or without a basic module as the situational tasking may dictate. All the modules together, plus the "fly-in echelon," which contains NMCB personnel, weapons, and communications equipment not on the MPSRONs, constitute a full NMCB. The MPF survey, liaison, and reconnaissance party (SLRP), the MPF advance party and the MPF offload preparation party (OPP) are not organic elements of the NMCB, but are temporary, subordinate elements of the MPF. Each element includes commander, MPF, naval coastal warfare, NSE, Navy cargo handling and port group, MPF MAGTF, and NCF and fleet hospital personnel. The SLRP, advance party, and OPP only exist temporarily to facilitate the establishment of the MPF MAGTF ashore.

- **MPF Survey, Liaison, and Reconnaissance Party.** The MPF SLRP is a detachment of personnel that deploys as the lead element in support of an MPF operation. The size of the SLRP is situation-dependent and typically consists of 3 to 8 NCF personnel.

- **MPF Advance Party.** The MPF advance party is the advance element of an NMCB, which assists the offload and receives NMCB equipment and supplies in support of the MAGTF in the MPF offload.

- **MPF Offload Preparation Party.** The MPF OPP deploys to the MPF squadron 4 days prior to offload to prepare the equipment for debarkation.

5. Construction Battalion Maintenance Unit

The construction battalion maintenance unit (CBMU) provides follow-on public works operations to maintain and repair existing advanced base shore facilities or facilities constructed by NMCBs during contingency operations. The unit is capable of equipping, manning, and maintaining water production as well as steam and electrical power generation and distribution systems for advanced base facilities of up to 5,000 personnel. A CBMU performs war damage repairs to base camps, power, sewage, POL, and water systems. A CBMU also operates and maintains automotive and construction equipment including materials handling

equipment (MHE). The unit is capable of limited operations in an NBC environment, possessing individual personal protective gear, limited chemical and radiological detection equipment, and decontamination apparatus capable of limited decontamination of equipment organic to the unit.

6. Construction Battalion Unit

CBUs support Navy fleet hospitals. Normally two CBUs deploy to provide the engineering, construction, maintenance, and repair services necessary to support a fleet hospital. Following the erection of fleet hospital facilities, the CBU provides operation, maintenance, repairs, and augments security for the facility. The unit is capable of deploying within 48 hours and erecting a combat zone fleet hospital within 10 days. The unit can perform limited operations in a NBC environment when attached to the fleet hospital, which provides CBU personnel with individual protective gear and limited chemical detection equipment.

7. Underwater Construction Team

UCTs are specially trained and equipped units that provide underwater engineering, construction, repair, and inspection capabilities to meet the Navy and Marine Corps or joint force operational requirements.

a. UCTs perform complex inshore and deep ocean underwater construction tasks in any climate, including the arctic. They provide ocean bottom surveys for appropriate site selection of underwater facilities. They are capable of diving and working to 190 feet depth and rely on self contained underwater breathing apparatus and/or surface supplied air. Typical projects include underwater repair of wharves, piers, pipelines, moorings, boat ramps, and underwater cable systems. The unit can also support offshore petroleum discharge equipment by installing single anchor leg moorings. The UCT can perform limited operations in a NBC environment and possess individual personal protective gear and limited chemical detection equipment.

b. A UCT is divided into three identical squad-sized air detachments and a platoon-sized sea echelon. The unit can deploy as one unit or separately. Each air detachment carries a surface decompression chamber as part of their TOA. The sea echelon would accompany larger unit equipment for sustained operations. The shore component of a UCT is used for equipment and follow-on logistics coordination.

8. Naval Construction Force Support Unit

NCFSUs provide logistic oriented construction support for the NCR as well as other NCF units. The unit provides support in the following areas:

a. Operation, maintenance and repair of local and long haul transportation equipment.

b. Operation and support of quarry and rock crusher operations, asphalt and concrete production and placement, and soil analysis and stabilization equipment.

c. The production and storage of potable water using 9 reverse osmosis purification units (600gph) and 9- 3000 gallon water bladders.

d. Construction material management including requisitioning, expediting, receiving, controlling, storing, issuing, and delivering.

e. Advanced facility planning, designing, estimating, and engineer support (as required) to execute construction projects.

f. Maintenance, custody, inventory control, and issuance of special SEABEE support equipment.

g. The unit is capable of limited operations in an NBC environment, possessing individual personal protective gear, limited chemical and radiological detection equipment and decontamination apparatus capable of decontamination of equipment organic to the unit.

9. Amphibious Construction Battalion

There are two ACBs in the NCF. The ACBs provide over-the-shore logistics movement and construction support to amphibious forces. ACBs are part of the NSE and report to the NBG, which is responsible for in-stream offloading of maritime ships in support of amphibious military operations. Their primary tasks are listed below.

a. Provide, assemble, and operate causeway barge ferries.

b. Provide side-loadable warping tugs and powered causeway sections for installation of piers, ELCAS, ship-to-shore bulk fuel and water systems, and the OPDS.

c. Provide, assemble, maintain, and operate the ELCAS and amphibious assault bulk fuel and bulk water systems.

d. Install the OPDS system with support from two UCT air detachments.

e. Establish and operate a support camp and provide limited construction support for the Naval beach group.

f. The unit is capable of limited operations in an NBC environment, possessing individual personal protective gear, limited chemical and radiological detection equipment and decontamination apparatus capable of decontamination of equipment organic to the unit.

For additional information on NCF units, refer to Office of the Chief of Naval Operations Instruction (OPNAVINST) 5450.46K, Naval Construction Force (NCF) Policy. *For additional information on ACB units, refer to OPNAVINST 3501.93D,* Projected Operational Environment (POE) and Required Operational Capabilities (ROC) for Naval Beach Groups and Their Elements.

Intentionally Blank

APPENDIX C
ENGINEERING UNITS OF THE AIR FORCE

1. General

Air Force mobility engineering forces, organized as Prime BEEF or RED HORSE units, provide support ranging from expeditionary civil to general engineering services across the range of military operations. Air Force engineering units can deploy either as a part of an AEF or as detached units operating in support of specific missions and operational taskings.

2. Air Force Civil Engineer Structure

Prime BEEF and RED HORSE units are deployed in unit type code (UTC) sets. Depending on the mission and engineering requirements, UTCs can be tailored as needed. **Prime BEEF** teams support missions (including recovery) at contingency operating locations. These teams provide beddown support at bare base and forward operating locations or follow-on sustainment support for smaller-scale contingencies and provide engineer support for other major theater war missions at contingency operating locations, aerial ports, en route bases, or critical bases. Prime BEEF teams are set up in modular, scalable UTCs which, when combined, are designed to provide beddown for up to 1,200 personnel and a lead aviation squadron using expedient or existing facilities as well as sustainment support of facilities and utilities. Other Prime BEEF UTC teams deploy with necessary command, control, and communications to conduct independent engineer, fire, crash, and/or rescue, NBC defense, and EOD operations to establish, sustain, defend, and recover a beddown location. Augmentation teams can be added to satisfy support at larger locations. Prime BEEF teams deploy with their individual protective clothing, hand tools, and selective team equipment; however, most construction equipment and supplies and all vehicles (except EOD) must be provided at the deployment location. **RED HORSE** squadrons and their associated UTC configurations provide highly mobile, largely self-sufficient, rapidly deployable echelons to support major force beddown requirements and to repair heavy war damage. RED HORSE units are stand-alone squadrons not tied to peacetime base support. They provide a dedicated, flexible airfield and base heavy construction and repair capability, along with base denial that allows the geographic combatant commanders to move and support missions as requirements dictate.

3. Prime BEEF Capabilities

Prime BEEF is the primary organizational structure for supporting both mobility and in-place contingency requirements. The principle objective of deploying Prime BEEF teams is to beddown and support an AEF, to maintain/sustain base facilities, and recover the base after attack. Force beddown generally divides into three categories — aircraft, personnel, and infrastructure support. Aircraft support provides the maintenance shops, hangars, squadron operations centers, munitions storage, fuel storage, and other facilities directly supporting the flying mission. Personnel support provides the housing, feeding facilities, latrines, showers, administrative offices, and other indirect support facilities. Infrastructure support provides the utility systems, solid and hazardous waste disposal, roads, and communications that serve the beddown site. Beddown locations range from main operating bases with adequate existing facilities to bare bases with no facilities other than runways, taxiways, and aircraft parking aprons along with a source of water.

a. **Prime BEEF tasks** executed during the deployment include the following:

- Airfield support operations — pavements, lighting, and mobile aircraft arresting system.
- Fire protection — aircraft crash, fire, and/or rescue, structural fire, and HAZMAT response.
- Fuel systems set-up and support.
- EOD operations and planning.
- NBC training, reconnaissance, and operations.
- Force protection and base defense.
- Rapid runway repair.
- Expedient facility repair and rapid utility repair.

b. **Prime BEEF UTCs.**

- 4F9EA — Prime BEEF AEF Team A.
- 4F9EB — Prime BEEF AEF Team B.
- 4F9EP — Prime BEEF AEF Team C.
- 4F9SA — Staff Augmentation Team.
- 4F9FL — Engineer Sustainment Team.
- 4F9AP — Power Production Team.
- 4F9DA — NBC Full Spectrum Threat Response Heavy Team.
- 4F9DB — NBC Full Spectrum Threat Response Light Team.
- 4F9DC — NBC Full Spectrum Threat Response Augmentation Team.
- 4F9DD — NBC Full Spectrum Threat Response Theater and/or Joint Task Force Planning and Support Staff.
- 4F9DE — NBC Full Spectrum Threat Response Contamination Control Team.
- 4F9DF — Lightweight NBC Reconnaissance System.
- 4F9DG — NBC Collective Protection System.
- 4F9DH — Open Air Contamination Control Area Set.
- 4F9DJ — Full Spectrum Threat Response Personnel Augmentation Team.
- 4F9DK — Lightweight NBC Reconnaissance Team.
- 4F9DL — NBC Collective Protection Equipment Set.
- 4F9FJ — Fire Protection Incident Command Team.
- 4F9FN — Fire Protection Management Augmentation.
- 4F9FP — Fire Protection Operations Team.
- 4F9XA — EOD Command and Control.
- 4F9XB — EOD En Route.
- 4F9X1 — EOD Lead Team.
- 4F9X2 — EOD Follow Team.
- 4F9X3 — EOD Base Support.
- 4F9X4 — EOD Augmentation.

- Special Teams.

  •• 4F9AC — Civil Engineering Maintenance, Inspection, and Repair Team — aircraft arresting systems, power systems, HVAC systems, and bare base systems.

  •• 4F9AC — Pavements Evaluation Team.

  •• Prime BEEF self-sustainability package.

  •• Snow Removal Team.

  •• En Route Airlift Support Team.

  •• EOD Contingency Team.

  •• Disaster Preparedness High Threat Team.

  •• Armored Base Recovery Vehicle Team.

  •• Armored Munitions Clearance Vehicle Team.

4. RED HORSE Capabilities

a. RED HORSE squadrons accomplish major construction (both vertical and horizontal) in forward locations, often in advance of the main deploying force. With their organic capabilities and stand-alone operations, RED HORSE squadrons are essential assets for early entry operations and JRSOI preparation. In addition to providing a heavy horizontal (e.g., earth moving and pavements) and vertical (e.g., facility and utility skills including POL, structural, electrical, mechanical, and power generation) capabilities, RED HORSE units also have the following special capabilities:

- Concrete and asphalt batch plant and paving operations.
- Mobile aircraft arresting system and navigational aid installation.
- Field dispensary and air transportable clinic operations.
- Automated building machine (K-Span) operations.
- Material testing.
- Quarry and rock crushing operations.
- Revetment erection and facility hardening.
- Water well drilling and sanitation system construction.
- Road, airfield, and ramp construction.
- Expedient site and airfield repair.
- Base denial.

b. RED HORSE mobility UTCs deploy with self-sustainment capabilities not found in Prime BEEF units, including organic logistics, services, medical, transportation, financial management, and contracting capability. Team equipment can be airlifted, shipped via sealift, drawn from pre-positioned stockpiles, or obtained from HN sources (e.g., contracting). Each RED HORSE squadron has the resources to conduct site development and heavy repair work at four different locations. The mobility UTCs are as follows:

- 4F9R-1 Advanced Team, deployable in 16 hours (12 hours with pre-positioned assets). Priority tasks include advanced airfield surveys, site layout, and planning for the establishment and future development of an operational location during contingencies. Team is self-sustaining at the deployed location, when water and fuel is available, for 5 days.

- The 4F9R-2 team forms the hub of the construction capability. It will be largely self-sufficient at the deployed location for 30 days. This team includes the C2 function of the entire squadron and contains personnel, skills, vehicles, and equipment to execute heavy horizontal and vertical construction. The UTC can deploy its full mission capability (MISCAP) in 96 hours and deploy personnel only in 24 hours.

- The 4F9R-3 UTC contains the specialized skills necessary to complete site development, construct and repair runways, taxiways, and ramps, and complete other horizontal construction. This UTC provides heavy horizontal and light vertical construction capabilities in austere environments. The UTC can deploy its full MISCAP in 6 days and deploy personnel only in 24 hours.

- The 4F9R-4 UTC contains specialized skills necessary to construct and repair facilities and infrastructure. It has limited capability to do earthwork, roads, and airfields. This UTC provides the heavy vertical and light horizontal construction capabilities in austere environments. The UTC can deploy its full MISCAP in 8 days and deploy personnel only in 24 hours.

- 4F9H1, Heavy Equipment Package, is designed to supplement 4F9R-2 and 4F9R-3; and provides full heavy earthwork capability. The package should come by sealift, but many items could come by C-5 or C-17, if necessary. This package includes T-9 dozers, belly scrapers, 4-cubic-yard front end loaders, size 7 graders, and a sheepsfoot roller. 4F9H2, Specialized Building Construction, includes an automatic building machine (K-span), a large crane, forms for footings, and stem walls and concrete placement tools. 4F9H3, Well Drilling, includes a well drilling rig, tow vehicle, trencher, casing, and drill bits. 4F9H4, Asphalt Batch Plant, includes asphalt batch plan and conveyor belts. 4F9H5, Concrete Batch Plant, includes concrete batch plant, a concrete transit, mixer, and conveyors. 459H6, Quarry Operations, includes rock drills, crusher, and rock dumps.

APPENDIX D
ENGINEERING UNITS OF THE MARINE CORPS

1. General

The Marine Corps is organized into three MEFs, each containing a command, ground combat, aviation combat, and CSS element. Each element except the command element contains organic engineer support. The MEF can form smaller task-organized MAGTFs to conduct expeditionary operations in littoral environments or other places as directed. A MAGTF ranges in size from a full MEF, to a Marine expeditionary brigade (MEB), down to a MEU or even smaller. MAGTFs normally contain task-organized elements from each of the primary engineer units.

2. Command Structures

Marine Corps engineer command structures and capabilities are as follows:

a. **Combat Engineer Battalion.** The combat engineer battalion (CEB) enhances the M/CM/S of the Marine division and provides close combat engineer support and limited general engineer support to the Marine division. A CEB contains a headquarters & service (H&S) company, engineer support company, and four combat engineer companies. An engineer support company contains heavy engineer equipment (e.g., bulldozers, cranes, and forklifts), motor transport equipment including dump trucks, and utilities equipment (e.g., shower units, mobile electric power generators, and water purification equipment). Normally, a combat engineer company reinforced with detachments of equipment and personnel from support company and H&S company provides the close combat engineer support to an infantry regiment. A combat engineer platoon reinforced with detachments of equipment and personnel from support company and H&S company provides close combat engineer support to an infantry battalion. A combat engineer squad provides close combat engineer support to an infantry company. While these are typical support relationships, the actual level of combat engineer support will depend on the situation and mission analysis.

b. **Engineer Support Battalion.** An engineer support battalion (ESB) increases the combat effectiveness of the MAGTF by accomplishing general engineering missions of a more deliberate nature. An ESB is organic to the force service support group but supports the entire MAGTF. An ESB contains a H&S company, engineer support company, three combat engineer companies, a bridge company (in only one of the three ESBs), and a bulk fuel company. An ESB contains EOD capabilities in the H&S company. An engineer support company contains medium bulldozers, road graders, scrapers, compactors, light and medium cranes, light and medium forklifts, mobile electric power generators, water purification units, welders, and limited organic motor transportation, including dump trucks. The ESB typically performs general engineering tasks such as pioneer road construction, expeditionary airfield construction, cantonment planning and execution, and limited vertical construction of a temporary nature.

c. **Marine Wing Support Squadron.** A Marine wing support squadron (MWSS) provides all essential aviation ground support requirements to a Marine aircraft group. MWSSs provide all essential aviation ground support and engineer support requirements to aid components of a Marine Corps forward operating base. One MWSS supports one Marine aircraft group or the aviation combat element (ACE) of a MEB. A task-organized detachment from the MWSS provides

aviation ground support to the ACE of a MEU. The engineers of an MWSS are located in the engineer operations division. MWSS engineering capabilities include providing the following: expeditionary airfield construction; rapid runway repair; mobile electric power; water purification and storage; refrigeration; light and medium MHE; light and medium bulldozers; welding; drafting and survey; and limited vertical construction. The MWSS has a bulk fuel section, under the control of airfield operations, responsible for storing and dispensing aircraft fuel. Limited EOD capabilities provide support for disposal of unexploded ordnance, airfield damage assessment, and aircraft emergency landings.

d. **Naval Construction Force.** The NCF may be assigned as a major subordinate element within the MAGTF to sustain MAGTF operations and maximize Naval civil engineering capabilities. Elements of the NCF construct and maintain base facilities, repair battle damaged facilities, conduct limited defensive operations as needed, and accomplish disaster control and recovery efforts when required. NCF units contain highly skilled specialists capable of projects of a more permanent nature than normally accomplished by Marine Corps engineers.

3. MAGTF Engineers

a. Engineer units are normally provided to each corresponding MAGTF as follows:

- **MEF.** A CEB, ESB, Marine wing support group, and NCR.
- **MEB.** A CEB, an ESB, an MWSS, and an NMCB.
- **MEU.** A reinforced platoon from a CEB, an engineer detachment from an MWSS (if task-organized), a detachment from an ESB, and civil engineer support from an NMCB, if required.

b. While these are typical support relationships, the actual level of combat engineer support will depend on the situation and mission analysis.

APPENDIX E
CONTRACT CONSTRUCTION AGENTS

1. General

The DOD CCAs are the USACE, NAVFACENGCOM, or other such approved DOD activity (see DODD 4270.5, *Military Construction Responsibilities*). These organizations and their contractors are a powerful force multiplier, allowing military engineers to concentrate on engineering missions in high threat areas. USACE and NAVFACENGCOM also provide the JFC with a significant engineering capability to be leveraged in joint operations. USACE and NAVFACENGCOM are the Department of Defense's principal organizations to plan, design, construct, and acquire (lease or buy) facilities and real estate. Inherent in their mission support capabilities is a planning and engineering capability for theater advanced base and infrastructure development. These organizations also maintain in-depth expertise in engineering research and development.

a. **Responsibilities.** The responsibilities of the DOD construction agents include the design, award, and management of construction contracts for projects associated with the peacetime military construction program. Overseas, USACE, NAVFACENGCOM, and the Air Force are assigned specific geographical areas under DODD 4270.5, *Military Construction Responsibilities* (see Figure E-1). Related to these responsibilities is the leasing of real estate.

Figure E-1. Designated Geographical Areas of Department of Defense Construction Agents

b. **Construction Contracting in Contingencies.** The CINC may also use USACE and NAVFACENGCOM as contingency CCAs for design, award, and management of construction contracts in support of military operations. For geographical areas where there is no designated DOD construction agent, the CINC will usually designate a CCA for support in a contingency. USACE and NAVFACENGCOM also provide facilities planning, contract administration, and technical engineering support to JFCs (e.g., advanced base master planning, topographic engineering, force-protection engineering, and cold-weather mobility). The Air Force also maintains a limited capability in contract construction in contingencies, and facility and real estate acquisition in England, Turkey, Spain, and Israel.

2. US Army Corps of Engineers

a. USACE is the Army major command assigned responsibility to execute the following Army and DOD mission areas:

- Engineering and Design.
- Contract Construction.
- Real Estate Acquisition.
- Technical Assistance.
- Topographic Engineering Support.
- The Army's Civil Works Program.

b. **Organization.** USACE's subordinate commands are organized geographically and functionally. There are four major organizational structures.

- **Divisions.** The division is the major subordinate C2 organization for USACE. The division commander provides executive direction to and management of the subordinate district commands. The division's orientation is regional and provides broad interface with regional interests and management of division-wide programs.
- **Districts.** The district command is the operating arm of the division. All CONUS USACE districts in the United States have civil works responsibilities. In the United States, their boundaries are delineated along major watershed basins and their work lines are set on state boundaries (see Figure E-2). In addition, some of the districts also have military execution responsibilities. The districts maintain in-house core capabilities in planning, engineering, construction, operations, project management, and contract administration. USACE provides support through subordinate commands to the following geographic combatant commands and subunified commands.

  •• US Forces Korea by Far East District (Seoul, Korea).

  •• US Forces Japan by Japan District (Camp Zama, Japan).

  •• Pacific Command by Honolulu District (Fort Shafter, Hawaii).

  •• Southern Command by Mobile District (Mobile, Alabama).

  •• European Command by European District (Wiesbaden, Germany).

  •• Central Command by Transatlantic Programs Center (Winchester, Virginia).

- **Laboratories.** The ERDC is the USACE's distributed research and development command headquartered in Vicksburg, Mississippi. ERDC consists of eight unique laboratories.

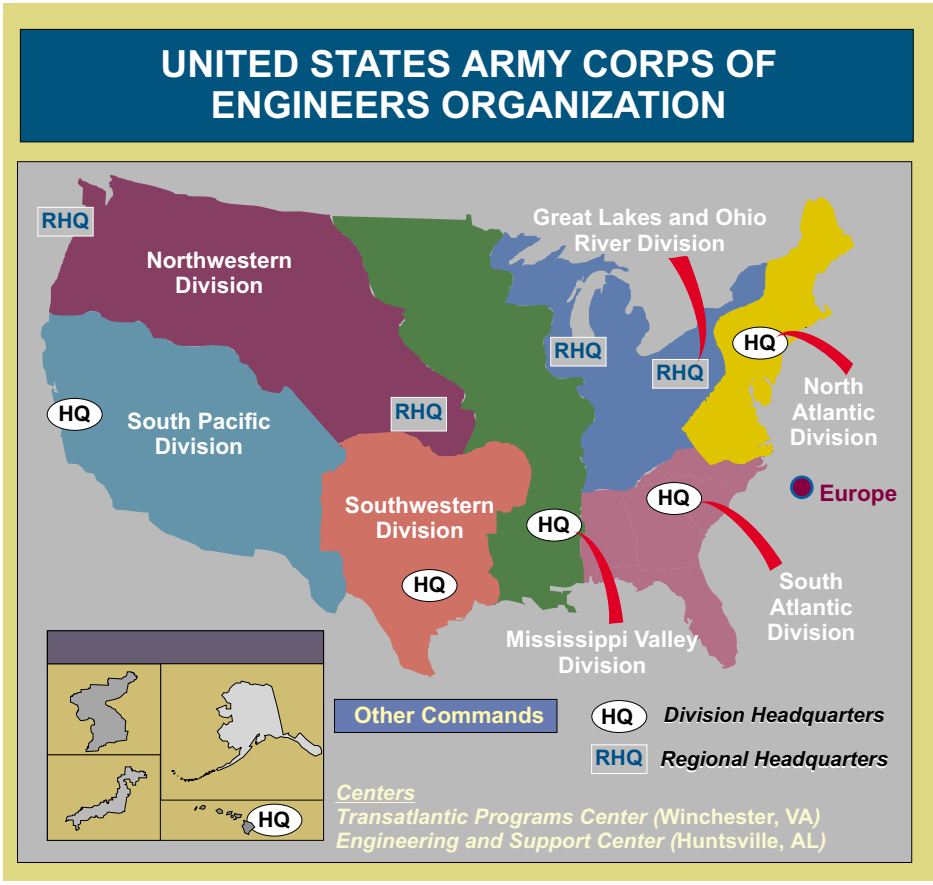


Figure E-2. United States Army Corps of Engineers Organization

•• Coastal and Hydraulics Laboratory, Vicksburg, Mississippi.

•• Cold Regions Research and Engineering Laboratory, Hanover, New Hampshire.

•• Construction Engineering Research Laboratory, Champaign, Illinois.

•• Environmental Laboratory, Vicksburg, Mississippi.

•• Geotechnical Laboratory, Vicksburg, Mississippi.

•• Information Technology Laboratory, Vicksburg, Mississippi.

•• Structures Laboratory, Vicksburg, Mississippi.

•• Topographic Engineering Center, Alexandria, Virginia.

c. **Military Support.** USACE designs and constructs military facilities and supports military installations worldwide. The military engineering expertise of the Corps is focused on the engineering required to plan, design, and construct military facilities, and the environmental engineering necessary to execute DOD installation environmental restoration projects. USACE maintains specialized expertise in its laboratories and centers for cold weather engineering, remote sensing and imagery, force protection design,

airfield design, weapons effects (e.g., support for operational targeting — assess the target, recommend appropriate weapon systems, and attack profile), terrain analysis for mobility and countermobility, topographic engineering, security systems engineering, environmental management, and environmental engineering. USACE's 249th Engineer Battalion (Prime Power) can conduct power assessments and install generators to provide emergency power.

3. Naval Facilities Engineering Command

a. NAVFACENGCOM and its field divisions directly support the Navy and Marine Corps and DOD shore establishment throughout the world with a wide variety of military and contract construction, real estate acquisition, and public works support. NAVFACENGCOM's engineering support units provide project management, planning, design engineering, construction, operations, and maintenance as well as disposal functions for Navy and Marine Corps shore facilities and real estate. They also provide engineering, logistics, doctrine and policy support, and guidance for NCF units.

b. **NAVFACENGCOM Command and Control.** NAVFACENGCOM and subordinate commands are organized geographically and functionally (see Figure E-3). NAVFACENGCOM headquarters is located in Washington, DC. Subordinate commands include: four engineering field divisions (EFDs), five engineering field activities (EFAs), OICCs, and the Naval Facilities Engineering Service Center (NFESC). In addition, NAVFACENGCOM provides technical support to ten regional Navy Public Works Centers.

- **Engineering Field Divisions and Engineering Field Activities.** The EFD

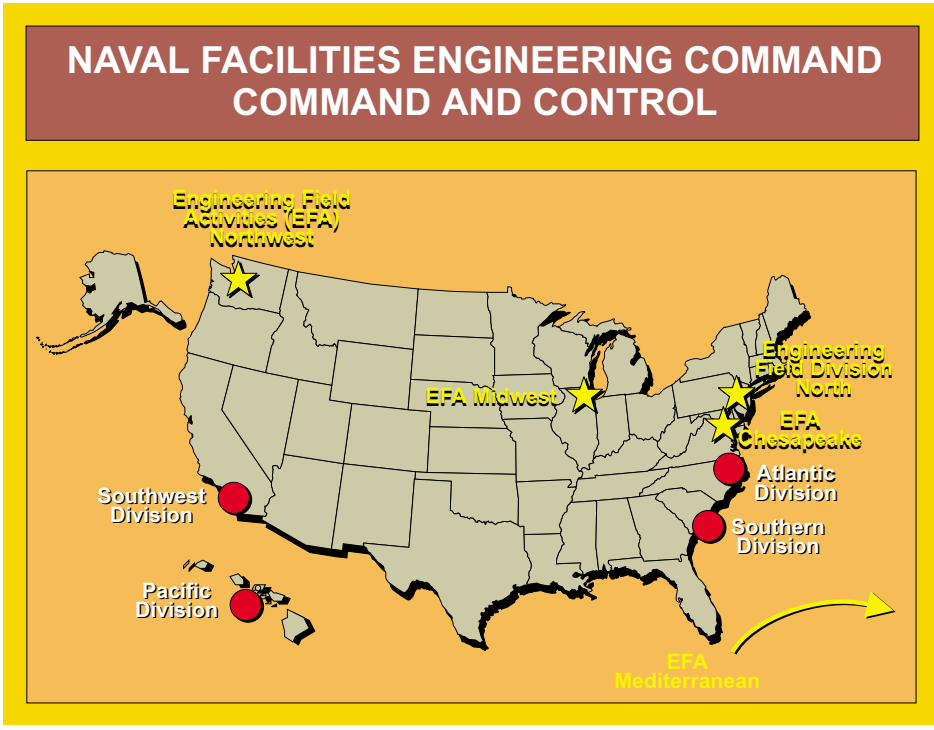


Figure E-3. Naval Facilities Engineering Command Command and Control

commanders provide executive management and engineering support for all Navy and Marine Corps facilities in designated geographical areas. EFAs provide similar support for smaller CONUS and overseas areas within the EFDs greater geographic area. Both EFDs and EFAs have design, engineering, and architecture capabilities and act as technical consultants for all facilities of supported commands. EFDs play a significant role in contingency operations through forward-deployed resident OICCs that can provide construction contracting and real estate support and manage the Navy's CONCAP.

- **Officer In Charge Construction.** The EFD commanders designate OICCs as contracting officers in certain geographical locations where the complexity and contracting tempo warrant. The EFD commander can also assign a resident officer in charge of construction (ROICC) in any geographical location as required. The ROICC is trained in facilities support, construction, engineering and environmental design, and real estate contract acquisition and management. The ROICC office is especially useful for contingency operations in support of the joint force. The ROICC may also provide construction management support to the Army, Air Force and Department of Defense, as well as other Federal agencies.

- **Naval Facilities Engineering Service Center.** The NFESC provides engineering support and expertise to the Navy in undersea and amphibious operations, conventional ammunition storage, mobile utilities and environmental support equipment, and research and consulting engineering services. The NFESC is located in Port Hueneme, California, with a detachment in Washington, DC (see Figure E-4).

4. NAVFACENGCOM Support for Military Operations

NAVFACENGCOM supports Navy and Marine Corps operations, DOD missions, and joint force operations around the world in the following ways.

a. **Force Projection.** The Navy accomplishes force projection worldwide by use of superior naval, air, and amphibious forces, equipment, tactics, and doctrine. This force projection requires shore logistic platforms, such as advanced logistic support sites, and ports to receive supplies, equipment, and personnel to be deployed to ships and advanced bases. NAVFACENGCOM directly supports these activities by providing engineering, construction forces, contract construction, and facilities management, including disposition of real estate, for these ports and bases.

b. **Theater Missions.** NAVFACENGCOM supports the theater through real estate acquisition, management, and final disposition, as well as construction of facilities to support Navy, Marine Corps, combatant commands, subordinate joint forces and other DOD elements. NAVFACENGCOM provides this support through the subordinate EFD and EFA, as well as providing technical engineering and construction support to other Services and DOD agencies through the NCF and as a designated CCA. The NAVFACENGCOM commander may provide a forward element dedicated to support the geographic combatant commander or subordinate JFC for military operations in contingencies. The forward element may call on the full capability of the entire NAVFACENGCOM organization to assist in providing this support.

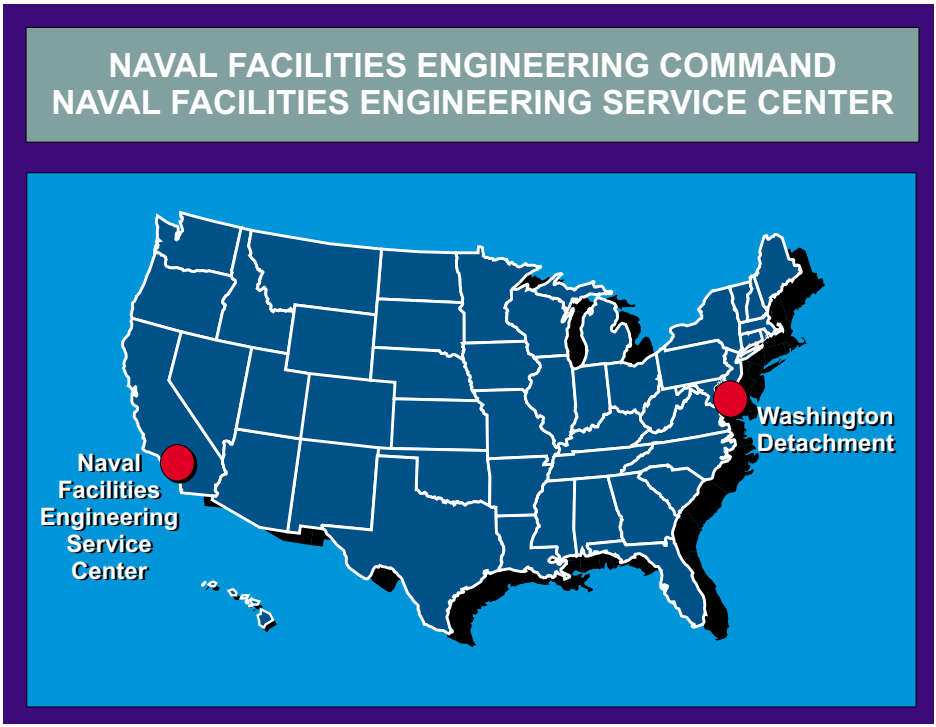


Figure E-4. Naval Facilities Engineering Command Naval Facilities Engineering Service Center

c. **CONUS Contingency Missions.** NAVFACENGCOM has responsibility for disaster recovery and other contingency operations at Navy and Marine Corps stations in CONUS. With NCF personnel and equipment, in addition to its contracting capability, NAVFACENGCOM can quickly mobilize and provide significant assets for disaster recovery.

APPENDIX F
CONTINGENCY AUTHORITIES AND FUNDING

1. Legal Personnel

Legal personnel can provide invaluable advice and guidance on types of authorities and sources of funding for civil engineering activities in a variety of situations. From the earliest stages of planning, execution, and redeployment, legal professionals play a vital role in preparation of the battlespace by identifying and assisting in the resolution of legal and political constraints as well as providing relevant and responsive readiness programs to the individual civil engineering members.

2. Types of Authorities and Sources of Funding

a. **Operation and Maintenance.** Services are authorized to use annual operation and maintenance (O&M) funds for construction projects less than $500K ($1M if to correct a life threatening condition or for new construction, and $2M for maintenance and repair of existing facilities). This is a peacetime provision which is applicable during contingencies and emergencies, however, "life threatening" is generally considered a safety issue vice an emergency in the context of contingency operations. During combat or designated contingency operations, O&M may be used under certain circumstances to fund construction projects exceeding these thresholds. The JFC must consult with their SJA before making a determination to use O&M in such a case.

b. **Title 10, USC, Emergency and Contingency Construction.** Several broad authorities have been established under title 10, USC, that enable the JFC to carry out contingency construction, including procuring materials for construction by military forces to funding of civilian contracts in support of contingency operations. Contingency construction funding authorities are provided as follows:

- Section 2803, "Emergency Military Construction," authorizes each Service to use $30M per year of unobligated military construction funds for projects that cannot wait for the normal military construction program submission procedures. Projects must comply with a 21-day Congressional notice and wait period before proceeding. Generally, a previously congressionally approved project must be canceled to free the $30M.

- Section 2804, "Contingency Construction," authorizes the Secretary of Defense to designate a specific military construction program line item amount for contingency construction projects that cannot wait for the normal military construction program submission process. Projects must comply with a 21-day Congressional notice and wait period before proceeding. Funding for this section has generally been limited to less than $10M per year.

- Section 2805, "Unspecified Minor Construction," authorizes to each Service a specific military construction program line item amount (varies annually) for unspecified minor construction. Projects must be less than $1.5M each ($3M if to correct a life threatening "safety" condition). Projects greater than $500K require 21 day Congressional notice and wait period before proceeding.

- Section 2808, "Construction Authority in the Event of a Declaration of War or National Emergency," requires a

Presidential Declaration of War or National Emergency and authorizes the Secretary of Defense to carry out any military construction project for the war or national emergency within the total amount of unobligated military construction program funds available. Congress must be notified of each project, but there is no wait requirement before the project may begin.

- Combatant commanders do not need specific authority to request projects under Sections 2803 and 2804. In order to gain approval for a project under either authority, it is necessary to provide the appropriate Service Secretary or the Secretary of Defense with a justification of need, estimated costs, and source of funding.

The contingency construction funding models shown in Figures F-1 and F-2 describe the process for contingency construction funding authorities.

3. Other Authorities and Sources of Funding

a. **Burdensharing (title 10, USC, section 2350j).** This statute provides authority enabling the Department of Defense to accept funds from HN or foreign governments for burdensharing of construction, supplies, and services.

- Countries must be "designated countries" which allow the Department of Defense to accept cash contributions for these purposes. Listing is held with the Office of the Secretary of Defense (Comptroller).

- If not previously designated, the Secretary of Defense must formally consult with the Secretary of State for designation of a particular country. The Joint Chiefs of Staff would submit formal request to the Secretary of Defense to initiate the process.

- Contributions can only be accepted for certain costs as follows:

  •• Compensation for foreign local national employees of the Department of Defense.

  •• DOD military construction projects.

  •• DOD supplies and services.

- Reporting procedures for military construction projects: A project is initiated when a report is submitted to congressional committees. There is a 21-day wait period for approval.

b. **Section 607A of the Foreign Assistance Act of 1961 (FAA of 1961) (Public Law 87-195, as amended).** Used to provide restoration of HN civil infrastructure. This provision of law allows any USG agency to provide goods and services to friendly countries and NGOs on an advance-of-funds or reimbursable basis.

c. **Arms Export Control Act of 1976 (Public Law 90-629, as amended).** HN military facilities may be restored under the foreign military sales provisions of this authority.

d. **Economy in Government Act (title 31, USC, section 1535).** Allows USG agencies to support each other provided that the supported agency has the funds and authority to do the work requested.

e. **Humanitarian and Civic Assistance (title 10, USC, section 401) Projects.** In HCA facilities projects, the JFC and joint force engineer may work with HN government agencies to repair or improve infrastructure and public facilities. These

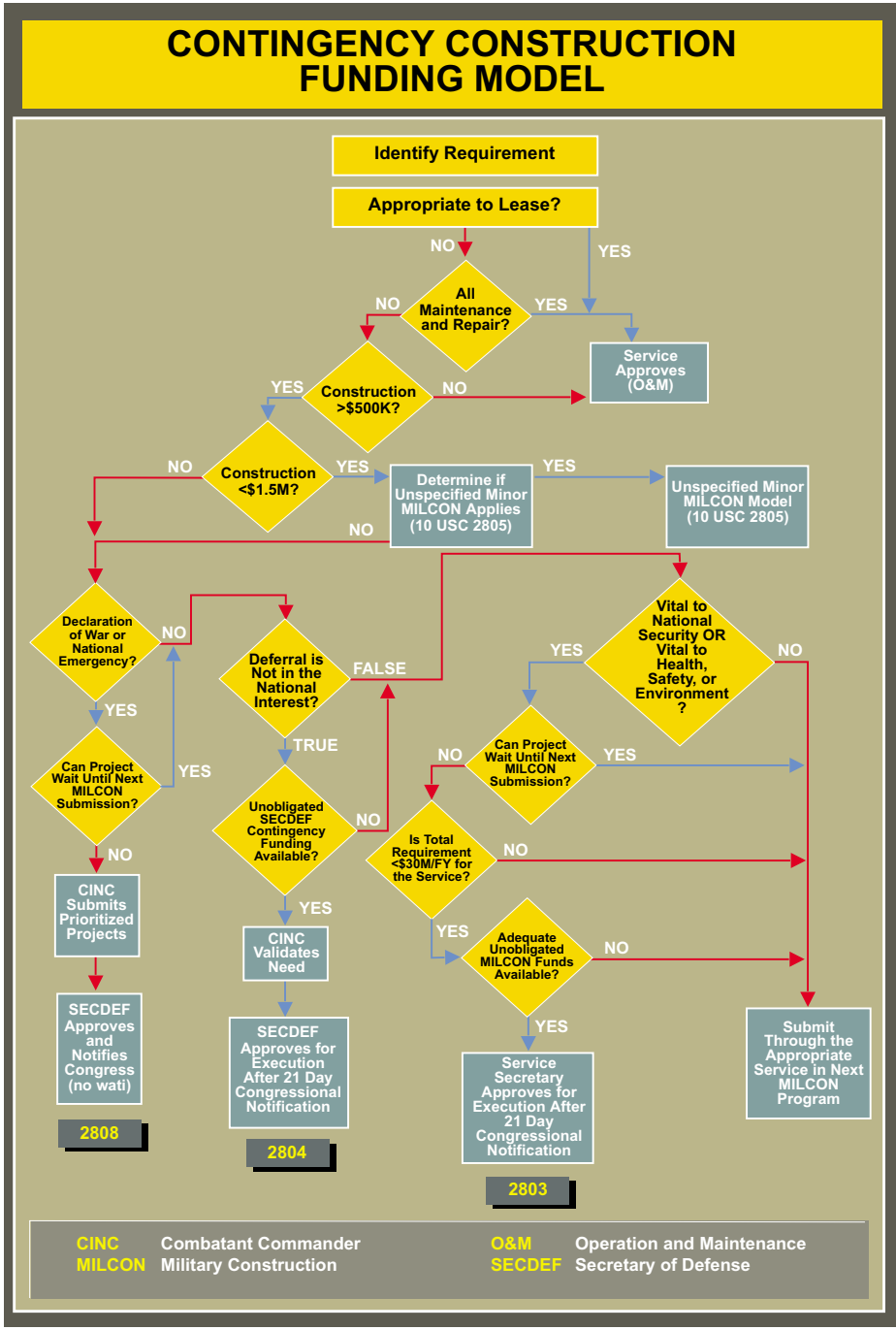


Figure F-1. Contingency Construction Funding Model

authorized and funded projects are designed to provide assistance to the HN populace in conjunction with a military operation or exercise. They are usually planned well in advance and are usually not in response to disasters, although HCA activities have been executed following disasters. Specific engineer activities for which HCA funds can

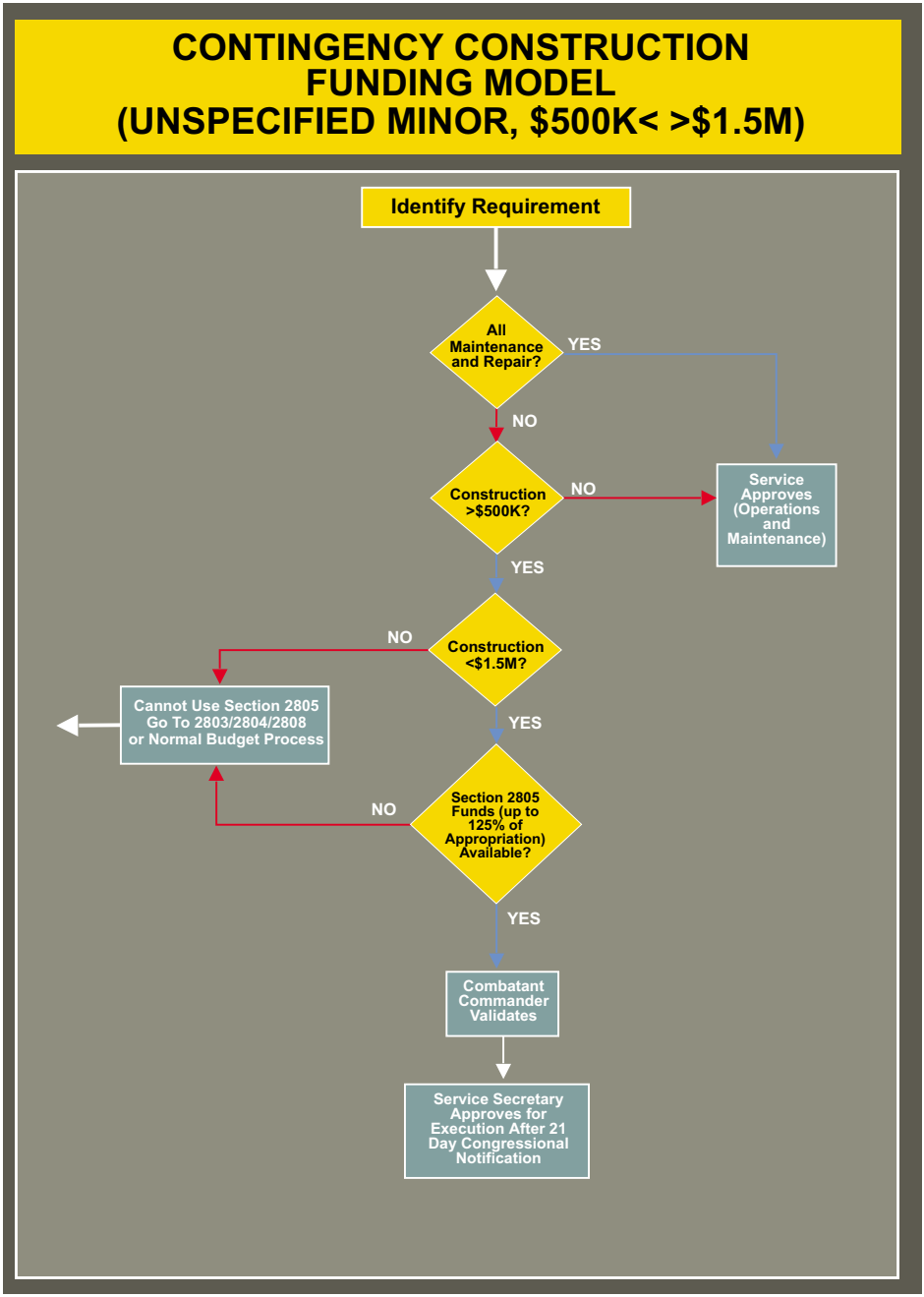


Figure F-2. Contingency Construction Funding Model (Unspecified Minor, >$500K and <$1.5M)

be used include construction of rudimentary surface transportation systems, water well drilling, construction of basic sanitation facilities, and rudimentary construction and repair of facilities.

f. **Foreign Humanitarian Assistance.** In disaster operations, the UN and the Department of State's OFDA may generate funded requirements for DOD assistance. FHA programs focus on the use of DOD excess property, emergency transportation support, disaster relief, or other support as necessary to alleviate urgent needs in a host country caused by some type of disaster or catastrophe. While other elements of the joint force are focused on immediate HA, civil engineering support planning may focus on projects that provide expedient shelter for dislocated civilians. The joint force engineer and staff should work closely with the representatives of the HN and US Country Team.

g. **Drawdown of DOD Defense Articles and Services (FAA of 1961 section 506(a)(1), title 22, USC, section 2318(a)(1), Appendix E, "Authorities and Agreements," of JP 1-06, *Joint Tactics, Techniques, and Procedures for Financial Management During Joint Operations*).** There are three drawdown authorities contained within the FAA of 1961. All three require a Presidential Determination and some form of notification to Congress. They are available for use within each fiscal year up to a specified dollar amount. The calculation of costs for all goods and services provided under these authorities, and reported to Congress, is on the basis of "full cost to the government." The calculation of costs includes the full cost of all military and civilian labor associated with the drawdown. This authority provides defense articles, equipment, military education, and training. It can also provide DOD services. Examples include military transportation, military sealift, and military personnel offloading ships with DOD supplies available for humanitarian relief purposes. It can be cited by the Department of Defense to contract for commercial air- or sealift if more economical. However, it cannot be used to provide housing and food under a LOGCAP contract to members of a foreign country or IO.

- ***Drawdown for an Unforeseen Emergency*, FAA of 1961 section 506(a)(1), title 22, USC, section 2318 (a)(1).** Under this section, military assistance (defense articles and services) can be furnished to a foreign country or IO on a nonreimbursable basis due to an unforeseen emergency. It requires a Presidential Determination and report in advance to Congress that an unforeseen emergency exists that cannot be met under the Arms Export Control Act or any other law. Peacekeeping is a recognized purpose for use of this drawdown authority.

- ***Drawdown for Refugee Assistance*, FAA of 1961 section 506(a)(2), title 22, USC, section 2318 (a)(2).** The President can drawdown DOD stocks for counterdrug, disaster relief, and refugee and migrant assistance purposes. This authority provides articles, equipment, and training. It can also provide DOD services. Examples include military transportation, military sealift, and military personnel offloading ships. This authority can be used for new contracting or procurement or it can be cited by the Department of Defense to contract for commercial air or sealift if more economical. However, it cannot be used to provide housing and food by contract. It requires a Presidential Determination and report, in advance, to Congress that it is in the national interest to execute the drawdown.

- ***Drawdown for Peacekeeping* FAA of 1961 section 552(c), title 22, USC, section 2348a.** The President can drawdown commodities and services from any US agency for unforeseen emergencies to support peacekeeping

activities. This authority can be used for new contracting or procurement it can be cited by the Department of Defense to contract for commercial air- or sealift if more economical. However, it cannot be used to provide housing and food. It requires a Presidential Determination and report, in advance, to Congress that an unforeseen emergency exists that requires the immediate provision of assistance.

h. **DODD 5100.46, *Responsibilities for Foreign Disaster Relief*.** Normally, DOD components may participate in foreign disaster relief operations only after a determination is made by the DOS. This directive allows the military commander at the scene of a disaster to undertake disaster relief operations without prior approval of the Ambassador and/or Chief of Mission when the emergency is so acute that immediate action is required to save life and property.

i. ***Exercise Related Construction* (ERC) (title 10, USC, section 2805).** ERC projects complement and enhance the CJCS Joint Training Plan Exercise Program. Projects will be developed to enhance the effectiveness of exercise activities, reduce overall exercise costs, enhance safety, and/or improve training of engineer forces. ERC may be accomplished by US troops, combined US-HN engineer forces, or by contractor (accomplishment by contractor is the least preferred option). Where an ERC project is planned in a country eligible for HCA, an HCA construction project should be planned in conjunction with the ERC project.

- ERC is defined as "an unspecified minor construction project," outside CONUS, in support of an in-progress or planned CJCS exercise that results in a facility, or facilities that remain, in any part after the end of the exercise.

- The cost of a single ERC project may not exceed $1,500,000. Each ERC project must be approved by the Joint Staff and reported to Congress. No construction funds may be obligated until the appropriate Congressional committees have approved the project or a 21-day waiting period has elapsed from the date of the notification. An ERC project includes all construction necessary to produce a complete and usable facility. Construction costs can vary +/- 25% without the requirement to request Joint Staff approval.

APPENDIX G
REFERENCES

The development of JP 4-04 is based upon the following primary references.

1. Joint Publications

a. JP 0-2, *Unified Action Armed Forces (UNAAF)*.

b. JP 1-02, *Department of Defense Dictionary of Military and Associated Terms.*

c. JP 2-03, *Joint Tactics, Techniques, and Procedures for Geospatial Information and Services Support to Joint Operations*.

d. JP 3-0, *Doctrine for Joint Operations.*

e. JP 3-07, *Joint Doctrine for Military Operations Other Than War*.

f. JP 3-07.1, *Joint Tactics, Techniques, and Procedures for Foreign Internal Defense (FID)*.

g. JP 3-07.3, *Joint Tactics, Techniques, and Procedures for Peace Operations*.

h. JP 3-07.6, *Joint Tactics, Techniques, and Procedures for Foreign Humanitarian Assistance*.

i. JP 3-07.7, *Joint Tactics, Techniques, and Procedures for Domestic Support Operations.*

j. JP 3-08, *Interagency Coordination During Joint Operations, Vol. I and II.*

k. JP 3-10, *Joint Doctrine for Rear Area Operations*.

l. JP 3-10.1, *Joint Tactics, Techniques, and Procedures for Base Defense Operations*.

m. JP 3-15, *Joint Doctrine for Barriers, Obstacles, and Mine Warfare.*

n. JP 3-16, *Joint Doctrine for Multinational Operations.*

o. JP 3-34, *Engineer Doctrine for Joint Operations*.

p. JP 3-35, *Joint Doctrine for Deployment and Redeployment Operations*.

q. JP 3-60, *Joint Doctrine for Targeting*.

r. JP 3-61, *Doctrine for Public Affairs in Joint Operations.*

s. JP 4-0, *Doctrine for Logistic Support of Joint Operations*.

t. JP 4-01.6, *Joint Tactics, Techniques, and Procedures for Joint Logistics Over-the-Shore (JLOTS)*.

u. JP 4-01.8, *Joint Tactics, Techniques, and Procedures for Joint Reception, Staging, Onward Movement, and Integration*.

v. JP 4-07, *Joint Tactics, Techniques, and Procedures for Common User Logistics During Joint Operations*.

w. JP 4-09, *Joint Doctrine for Global Distribution*.

x. JP 5-0, *Doctrine for Planning Joint Operations*.

y. JP 5-00.2, *Joint Task Force Planning Guidance and Procedures*.

z. JP 6-0, *Doctrine for Command, Control, Communications, and Computer (C4) Systems Support to Joint Operations*.

aa. JP 6-02, *Joint Doctrine for Employment of Operational/Tactical Command, Control, Communications, and Computer Systems*.

2. Service Publications

a. AFDD 1, *Air Force Basic Doctrine*.

b. AFDD 2, *Organization and Employment of Aerospace Forces*.

c. AFDD 2-1, *Air Warfare*.

d. AFDD 2-3, *Military Operations Other Than War*.

e. AFDD 2-4, *Combat Support*.

f. AFDD 2-4.3, *Civil Engineering*.

g. AFDD 2-4.4, *Bases, Infrastructure, and Facilities*.

h. *Prime BEEF Implementation Guide*.

i. Air Force Handbook 10-222, Volumes 1-6.

j. *Air Force Environmental Handbook for Contingency Operations*.

k. FM 3-100.4/MCRP 4-11B, *Environmental Considerations in Military Operations*.

l. FM 5-100, *Engineer Operations*.

m. FM 5-100-15, *Corps Engineering Operations*.

n. FM 5-101, *Mobility*.

o. FM 5-103, *Survivability*.

p. FM 5-104, *General Engineering*.

q. FM 5-105, *Topographic Operations*.

r. FM 5-114, *Engineer Operations Short of War*.

s. FM 5-116, *Engineer Operations: Echelons Above Corps*.

t. FM 5-170, *Engineer Reconnaissance*.

u. FM 5-490, *Engineer Diving Operations*.

v. FM 34-3, *Intelligence Analysis*.

w. FM 41-10, *Civil Affairs Operations*.

x. MCWP 3-17, *MAGTF Engineer Operations*.

y. MCWP 3-17.2, *EOD Operations*.

z. MCWP 3-17.4, *Engineer Reconnaissance*.

aa. Naval Warfare Pub 4-04, *Naval Civil Engineering Operations*.

bb. Naval Warfare Pub 4-04.1/Marine Corps Warfare Pub 4-11.5, *Seabee Operations in the MAGTF*.

cc. Naval Warfare Pub 4-04.2, *Naval Civil Engineering Operations for Component Commanders*.

dd. Naval Warfare Pub 4-11, *Environmental Protection*.

ee. NAVFAC P315, *Naval Construction Force Manual*.

3. Executive Orders, Directives, Instructions and Manuals

a. Executive Order 12088, *Federal Compliance with Pollution Control Standards*.

b. Executive Order 12114, *Environmental Effects Abroad of Major Federal Actions*.

c. Executive Order 12656, *Assignment of Emergency Preparedness Responsibilities*.

d. DOD Directive 1315.6, *Responsibilities of Military Troop Construction Support of the Department of the Air Force Overseas*.

e. DOD Directive 2000.13, *Civil Affairs*.

f. DOD Directive 2010.9, *Mutual Logistic Support Between the United States and Governments of Eligible Countries and NATO Subsidiary Bodies*.

g. DOD Directive 3025.1, *Military Support to Civil Authorities*.

h. DOD Directive 4160.21-M, *Defense Utilization and Disposal Manual*.

i. DOD Directive 4270.5, *Military Construction Responsibilities*, as amended by the Office of the Assistant Secretary of Defense (Acquisition and Logistics) letter of 20 March 1986.

j. DOD Directive 4270.36, *DOD Emergency, Contingency, and Other Unprogrammed Construction*.

k. DOD Directive 4715.9, *Environmental Planning and Analysis*.

l. DOD Directive 5100.1, *Functions of the Department of the Defense and its Major Components*.

m. DOD Directive 5100.46, *Foreign Disaster Relief*.

n. DOD Directive 6050.7, *Environmental Effects Abroad of Major Department of Defense Actions*.

o. DOD Instruction 4165.3, *Department of Defense Facility Classes and Construction Categories*.

p. DOD Instruction 4715.5, *Management of Environmental Compliance at Overseas Installations*.

q. DOD Instruction 4715.8, *Environmental Remediation Policy for DOD Activities Overseas*.

r. Joint Staff Instruction 3820.01, *Environmental Engineering Effects of DOD Actions*.

s. CJCSM 3122.03A, *Joint Operation Planning and Execution System Vol. II: (Planning Formats and Guidance)*.

t. CJCSM 3141.01, *Procedures for Review of Operation Plans*.

u. OPNAVINST 3501.93D, *Projected Operational Environment (POE) and Required Operational Capabilities (ROC) for Naval Beach Groups and Their Elements*.

v. OPNAVINST 5450.46K, *Naval Construction Force (NCF) Policy*.

w. Overseas Environmental Baseline Guidance Document (OEBGD).

x. Basel Convention on the Control of Transboundary Movements of Hazardous Wastes.

y. Federal Response Plan.

Intentionally Blank

APPENDIX H
ADMINISTRATIVE INSTRUCTIONS

1. User Comments

Users in the field are highly encouraged to submit comments on this publication to: Commander, United States Joint Forces Command, Joint Warfighting Center Code JW100, 116 Lake View Parkway, Suffolk, VA 23435-2697. These comments should address content (accuracy, usefulness, consistency, and organization), writing, and appearance.

2. Authorship

The lead agent for this publication is the US Navy. The Joint Staff doctrine sponsor for this publication is the Director for Logistics (J-4).

3. Supersession

This publication supersedes JP 4-04, 26 September 1995, *Joint Doctrine for Civil Engineering Support*.

4. Change Recommendations

a. Recommendations for urgent changes to this publication should be submitted:

TO: JOINT STAFF WASHINGTON DC//J4//
INFO: JOINT STAFF WASHINGTON DC//J7-JDETD//

Routine changes should be submitted to the Director for Operational Plans and Joint Force Development (J-7), JDETD, 7000 Joint Staff Pentagon, Washington, DC 20318-7000, with info copies to the USJFCOM JWFC.

b. When a Joint Staff directorate submits a proposal to the Chairman of the Joint Chiefs of Staff that would change source document information reflected in this publication, that directorate will include a proposed change to this publication as an enclosure to its proposal. The Military Services and other organizations are requested to notify the Director, J-7, Joint Staff, when changes to source documents reflected in this publication are initiated.

c. Record of Changes:

CHANGE NUMBER	COPY NUMBER	DATE OF CHANGE	DATE ENTERED	POSTED BY	REMARKS

5. Distribution

a. Additional copies of this publication can be obtained through Service publication centers listed below (initial contact) or the USJFCOM JWFC in the event that the joint publication is not available from the Service.

b. Only approved joint publications and joint test publications are releasable outside the combatant commands, Services, and Joint Staff. Release of any classified joint publication to foreign governments or foreign nationals must be requested through the local embassy (Defense Attaché Office) to DIA Foreign Liaison Office, PSS, PO-FL, Room 1A674, Pentagon, Washington, DC 20301-7400.

c. Additional copies should be obtained from the Military Service assigned administrative support responsibility by DOD Directive 5100.3, 1 November 1988, *Support of the Headquarters of Unified, Specified, and Subordinate Joint Commands.*

Army:	US Army AG Publication Center SL 1655 Woodson Road Attn: Joint Publications St. Louis, MO 63114-6181
Air Force:	Air Force Publications Distribution Center 2800 Eastern Boulevard Baltimore, MD 21220-2896
Navy:	CO, Naval Inventory Control Point 700 Robbins Avenue Bldg 1, Customer Service Philadelphia, PA 19111-5099
Marine Corps:	Commander (Attn: Publications) 814 Radford Blvd, Suite 20321 Albany, GA 31704-0321
Coast Guard:	Commandant Coast Guard (G-OPD), US Coast Guard 2100 2nd Street, SW Washington, DC 20593-0001
	Commander USJFCOM JWFC Code JW2102 Doctrine Division (Publication Distribution) 116 Lake View Parkway Suffolk, VA 23435-2697

d. Local reproduction is authorized and access to unclassified publications is unrestricted. However, access to and reproduction authorization for classified joint publications must be in accordance with DOD Regulation 5200.1-R, *Information Security Program*.

GLOSSARY

PART I — ABBREVIATIONS AND ACRONYMS

ABCS	Army Battle Command System
ACB	amphibious construction battalion
ACE	aviation combat element
ADC	area damage control
ADCON	administrative control
AEF	air expeditionary force
AFCAP	Air Force contract augmentation program
AFCESA	Air Force Civil Engineering Support Agency
APOD	aerial port of debarkation
ASCC	Army service component command
BII	base information infrastructure
C2	command and control
C4	command, control, communications, and computers
CAP	crisis action planning
CBMU	construction battalion maintenance unit
CBU	construction battalion unit
CCA	contract construction agent (DOD)
CEB	combat engineer battalion
CESP	Civil Engineering Support Plan
CINC	commander of a combatant command
CJCS	Chairman of the Joint Chiefs of Staff
CJCSM	Chairman of the Joint Chiefs of Staff Manual
CJTF	commander, joint task force
CMO	civil-military operations
CMOC	civil-military operations center
COA	course of action
CONCAP	construction capabilities contract (Navy)
CONUS	continental United States
CP	command post
CS	combat support
CSS	combat service support
DCO	defense coordinating officer
DFO	disaster field office
DJTFAC	deployable joint task force (JTF) augmentation cell
DLA	Defense Logistics Agency
DOD	Department of Defense
DODD	Department of Defense Directive
DODI	Department of Defense Instruction
DOMS	Director of Military Support
DOS	Department of State
DSO	domestic support operations

EAC	echelons above corps
EEA	environmental executive agent
EFA	engineering field activity
EFD	engineering field division
ELCAS	elevated causeway system
ENCOM	engineer command
EO	executive order
EOD	explosive ordnance disposal
EPA	Environmental Protection Agency
ERC	exercise related construction
ERDC	Engineer Research and Development Center
ERRO	Emergency Response and Recovery Office
ESB	engineer support battalion
ESF	emergency support function
FAA	Foreign Assistance Act
FE	facilities engineering
FEMA	Federal Emergency Management Agency
FGS	final governing standard
FHA	foreign humanitarian assistance
FM	Field Manual
FRP	Federal Response Plan
GCCS	Global Command and Control System
GCCS-A	Global Command and Control System-Army
H&S	headquarters and service
HA	humanitarian assistance
HAZMAT	hazardous material
HCA	humanitarian and civic assistance
HF	high frequency
HN	host nation
HNS	host-nation support
HNSA	host-nation support agreement
HQ	headquarters
HVAC	heating, ventilation, and air conditioning
IO	international organization
IR	information requirement
ISA	international standardization agreement
ISB	intermediate staging base
J-2	intelligence directorate of a joint staff
J-3	operations directorate of a joint staff
J-4	logistics directorate of a joint staff
JCMEB	joint civil-military engineering board
JEMB	Joint Environmental Management Board
JFACC	joint force air component commander

JFC	joint force commander
JFSOCC	joint force special operations component commander
JFUB	Joint Facilities Utilization Board
JLOTS	joint logistics over-the-shore
JOPES	Joint Operation Planning and Execution System
JP	joint publication
JPG	joint planning group
JRSOI	joint reception, staging, onward movement, and integration
JTF	joint task force
JTFCEM	joint task force contingency engineering management
LOC	line of communications
LOGCAP	logistics civilian augmentation program (Army)
MAGTF	Marine air-ground task force
M/CM/S	mobility, countermobility, and survivability
MEB	Marine expeditionary brigade
MEF	Marine expeditionary force
MEU	Marine expeditionary unit
MGB	medium girder bridge
MHE	materials handling equipment
MISCAP	mission capability
MNF	multinational force
MOOTW	military operations other than war
MPF	maritime pre-positioning force
MPSRON	maritime pre-positioning squadron
MSR	main supply route
MWSS	Marine wing support squadron
NATO	North Atlantic Treaty Organization
NAVFACENGCOM	Naval Facilities Engineering Command
NBC	nuclear, biological, and chemical
NBG	naval beach group
NCB	naval construction brigade
NCF	naval construction force
NCFSU	naval construction force support unit
NCR	naval construction regiment
NEPA	National Environmental Policy Act
NFESC	Naval Facilities Engineering Service Center
NGO	nongovernmental organization
NIMA	National Imagery and Mapping Agency
NIPRNET	Non-Secure Internet Protocol Router Network
NMCB	naval mobile construction battalion
NSE	Navy support element
O&M	operation and maintenance
OEBGD	Overseas Environmental Baseline Guidance Document
OFDA	Office of Foreign Disaster Assistance

OICC	officer in charge of construction
OPCON	operational control
OPDS	offshore petroleum discharge system
OPLAN	operation plan
OPNAVINST	Office of the Chief of Naval Operations Instruction
OPORD	operation order
OPP	offload preparation party
PAO	public affairs officer
PIR	priority intelligence requirement
POL	petroleum, oils, and lubricants
Prime BEEF	Prime Base Engineer Emergency Force
RCEM	regional contingency engineering management
RED HORSE	Rapid Engineer Deployable Heavy Operations Repair Squadron Engineer
ROICC	resident officer in charge of construction
SEABEE	Navy construction engineer
SecDef	Secretary of Defense
SIPRNET	SECRET Internet Protocol Router Network
SJA	staff judge advocate
SLRP	survey, liaison, and reconnaissance party
SOFA	status-of-forces agreement
SPOD	seaport of debarkation
TACON	tactical control
TCEM	theater contingency engineering management
TOA	table of allowance
TPFDD	time-phased force and deployment data
UCT	underwater construction team
UHF	ultrahigh frequency
UN	United Nations
USACE	United States Army Corps of Engineers
USAID	United States Agency for International Development
USAMC	United States Army Materiel Command
USC	United States Code
USG	United States Government
UTC	unit type code
VHF	very high frequency
WMD	weapons of mass destruction

advanced base. A base located in or near an operational area whose primary mission is to support military operations. (JP 1-02)

allocation. In a general sense, distribution of limited resources among competing requirements for employment. Specific allocations (e.g., air sorties, nuclear weapons, forces, and transportation) are described as allocation of air sorties, nuclear weapons, etc. (JP 1-02)

apportionment. In the general sense, distribution for planning of limited resources among competing requirements. Specific apportionments (e.g., air sorties and forces for planning) are described as apportionment of air sorties and forces for planning, etc. See also allocation. (JP 1-02)

base development (less force beddown). The acquisition, development, expansion, improvement and construction and/or replacement of the facilities and resources of an area or location either to support forces employed in military operations or deployed in accordance with strategic plans. (JP 1-02)

baseline environmental survey. A multi-disciplinary site survey conducted prior to or in the initial stage of a joint operational deployment. The survey documents existing deployment-area environmental conditions, determines the potential for present and past site contamination (e.g., hazardous substances, petroleum products, and derivatives), and identifies potential vulnerabilities (to include occupational and environmental health risks). Surveys accomplished in conjunction with joint operational deployments that do not involve training or exercises (e.g., contingency operations) should be completed to the extent practicable consistent with operational requirements. (Upon approval of this revision, this term and its definition will be included in the next edition of JP 1-02.)

battlespace. The environment, factors, and conditions which must be understood to successfully apply combat power, protect the force, or complete the mission. This includes the air, land, sea, space, and the included enemy and friendly forces, facilities, weather, terrain, the electromagnetic spectrum, and the information environment within the operational areas and areas of interest. (JP 1-02)

building systems. Structures assembled from manufactured components designed to provide specific building configurations (e.g., large steel arch structures, large span tension fabric structures, panelized buildings, and pre-engineered buildings). (Upon approval of this revision, this term and its definition will be included in the next edition of JP 1-02.)

civil affairs. Designated Active and Reserve component forces and units organized, trained, and equipped specifically to conduct civil affairs activities and to support civil-military operations. (JP 1-02)

civil engineering. Those combat support or combat service support activities that identify, design, construct, lease or provide facilities, and which operate, maintain, and perform war damage repair and other engineering functions in support of military operations. (JP 1-02)

civil engineering support plan. An appendix to the logistics annex or separate annex of an operation plan that identifies the minimum essential engineering services

and construction requirements required to support the commitment of military forces. Also called CESP. (JP 1-02)

civil-military operations. The activities of a commander that establish, maintain, influence, or exploit relations between military forces, governmental and nongovernmental civilian organizations and authorities, and the civilian populace in a friendly, neutral, or hostile operational area in order to facilitate military operations, to consolidate and achieve operational US objectives. Civil-military operations may include performance by military forces of activities and functions normally the responsibility of the local, regional, or national government. These activities may occur prior to, during, or subsequent to other military actions. They may also occur, if directed, in the absence of other military operations. Civil-military operations may be performed by designated civil affairs, by other military forces, or by a combination of civil affairs and other forces. Also called CMO. (JP 1-02)

civil-military operations center. An ad hoc organization, normally established by the geographic combatant commander or subordinate joint force commander, to assist in the coordination of activities of engaged military forces, and other United States Government agencies, nongovernmental organizations, and regional and international organizations. There is no established structure, and its size and composition are situation dependent. Also called CMOC. (JP 1-02)

combat engineering. Those engineering tasks that assist the tactical and/or operational commander to "shape" the battlespace by enhancing mobility creating the space and time necessary to generate mass and speed while protecting the force, and denying mobility and key terrain to the enemy. These tasks include breaching, bridging, and emplacement of obstacles to deny mobility to the enemy. (JP 1-02)

contingency engineering management organization. An organization that may be formed by the combatant commander, or subordinate joint force commander to augment the combatant command, or subordinate joint force staffs to provide additional Service engineering expertise to support both deliberate and crisis action planning and to provide construction management in contingency and wartime operations. The combatant commander may form a theater contingency engineering management cell, and similar organizations may be formed at subordinate levels of command (e.g., regional contingency engineering management cell and/or joint task force contingency engineering management cell). These organizations should be staffed with expertise in combat engineering, general engineering, and topographic engineering. (JP 1-02)

countermobility operations. The construction of obstacles and emplacement of minefields to delay, disrupt, and destroy the enemy by reinforcement of the terrain. The primary purpose of countermobility operations is to slow or divert the enemy, to increase time for target acquisition, and to increase weapons effectiveness. (JP 1-02)

Department of Defense construction agent. The Corps of Engineers, Naval Facilities Engineering Command, or other such approved Department of Defense activity, that is assigned design or execution responsibilities associated with military construction programs, facilities support, or civil engineering support to the combatant commanders in contingency operations. (JP 1-02)

environmental considerations. The spectrum of environmental media,

resources, or programs that may impact on, or are affected by, the planning and execution of military operations. Factors may include, but are not limited to, environmental compliance, pollution prevention, conservation, protection of historical and cultural sites, and protection of flora and fauna. (JP 1-02)

exercise. A military maneuver or simulated wartime operation involving planning, preparation, and execution. It is carried out for the purpose of training and evaluation. It may be a multinational, joint, or single-Service exercise, depending on participating organizations. (JP 1-02)

facility. A real property entity consisting of one or more of the following: a building, a structure, a utility system, pavement, and underlying land. (JP 1-02)

facility substitutes. Items such as tents and prepackaged structures that may be used to substitute for constructed facilities. (JP 1-02)

final governing standards. A comprehensive set of country-specific substantive environmental provisions, typically technical limitations on effluent, discharges, etc., or a specific management practice. (JP 1-02)

force beddown. The provision of expedient facilities for troop support to provide a platform for the projection of force. These facilities may include modular kit-type facility substitutes. (JP 1-02)

forward aviation combat engineering. A mobility operation in which engineers perform tasks in support of forward aviation ground facilities. Tasks include reconnaissance, construction of low altitude parachute extraction zones, landing strips, and airstrips; and providing berms, revetments, and trenches for forward arming and refueling points. (JP 1-02)

general engineering. Encompasses the construction and repair of lines of communications, main supply routes, airfields, and logistic facilities to support joint military operations and may be performed in direct support of combat operations, such as battle damage repair. These operations include both horizontal and vertical construction, and may include use of both expedient repair methods, and more deliberate construction methods characterized by the application of design criteria, advanced planning, and preparation, depending on the mission requirements. (JP 1-02)

hydrography. The science that deals with the measurements and description of the physical features of the oceans, seas, lakes, rivers, and their adjoining coastal areas, with particular reference to their use for navigational purposes. (JP 1-02)

infrastructure. All building and permanent installations necessary for the support, redeployment, and military forces operations (e.g., barracks, headquarters, airfields, communications, facilities, stores, port installations, and maintenance stations) (JP 1-02)

joint operations. A general term to describe military actions conducted by joint forces, or by Service forces in relationships (e.g., support, coordinating authority), which, of themselves, do not create joint forces. (JP 1-02)

logistics. The science of planning and carrying out the movement and maintenance of forces. In its most comprehensive sense, those aspects of military operations which deal with: a. design and development, acquisition, storage, movement, distribution,

maintenance, evacuation, and disposition of materiel; b. movement, evacuation, and hospitalization of personnel; c. acquisition or construction, maintenance, operation and disposition of facilities; and d. acquisition or furnishing of services. (JP 1-02)

mobility. A quality or capability of military forces which permits them to move from place to place while retaining the ability to fulfill their primary mission. (JP 1-02)

operation. A military action or the carrying out of a strategic, tactical, service, training, or administrative military mission. (JP 1-02)

operational environment. A composite of the conditions, circumstances, and influences which affect the employment of military forces and bear on the decisions of the unit commander. Some examples are: a. permissive environment — operational environment in which the host country military and law enforcement agencies have control and the intent and capability to assist operations that a unit intends to conduct. b. uncertain environment — operational environment in which host government forces, whether opposed to or receptive to operations that a unit intends to conduct, do not have totally effective control of the territory and population in the intended area of operations. c. hostile environment — operational environment in which the hostile forces have control and the intent and capability to effectively oppose or react to the operations a unit intends to conduct. (JP 1-02)

operational level of war. The level of war at which campaigns and major operations are planned, conducted, and sustained to accomplish strategic objectives within theaters or operational areas. Activities at this level link tactics and strategy by establishing operational objectives needed to accomplish the strategic objectives, sequencing events to achieve the operational objectives, initiating actions, and applying resources to bring about and sustain these events. These activities imply a broader dimension of time or space than do tactics; they ensure the logistic and administrative support of tactical forces, and provide the means by which tactical successes are exploited to achieve strategic objectives. (JP 1-02)

Overseas Environmental Baseline Guidance Document. A set of objective criteria and management practices developed by the Department of Defense to protect human health and the environment. Also called OEBGD. (Upon approval of this revision, this term and its definition will modify the existing term and its definition and will be included in JP 1-02.)

real property. Lands, buildings, structures, utilities systems, improvements, and appurtenances thereto. Includes equipment attached to and made part of buildings and structures (such as heating systems), but not movable equipment (such as plant equipment). (JP 1-02)

RED HORSE. Air Force units wartime-structured to provide heavy engineer capability. They have a responsibility across the operational area, are not tied to a specific base, and are not responsible for base operation and maintenance. These units are mobile, rapidly deployable, and largely self-sufficient for limited periods of time. (JP 1-02)

strategic level of war. The level of war at which a nation, often as a member of a group of nations, determines national or multinational (alliance or coalition) security objectives and guidance, and develops and uses national resources to accomplish these objectives. Activities at this level establish national and multinational military

objectives; sequence activities; define limits an assess risks for the use of military and other instruments of national power; develop global plans or theater war plans to achieve these objectives; and provide military forces and other capabilities in accordance with strategic plans. (JP 1-02)

survivability. Concept which includes all aspects of protecting personnel, weapons, and supplies while simultaneously deceiving the enemy. Survivability tactics include building a good defense; employing frequent movement; using concealment, deception, and camouflage; and constructing fighting and protective positions for both individuals and equipment. (JP 1-02)

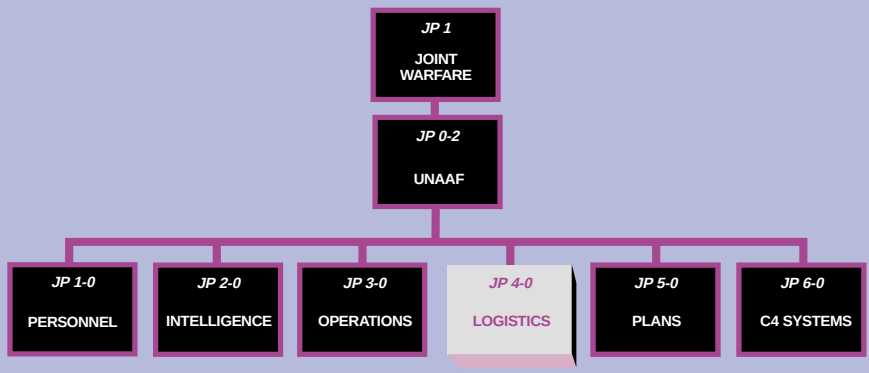
sustainment. The provision of personnel, logistic, and other support required to maintain and prolong operations or combat until successful accomplishment or revision of the mission or of the national objective. (JP 1-02)

tactical level of war. The level of war at which battles and engagements are planned and executed to accomplish military objectives assigned to tactical units or task forces. Activities at this level focus on the ordered arrangement and maneuver of combat elements in relation to each other and the enemy to achieve combat objectives. (JP 1-02)

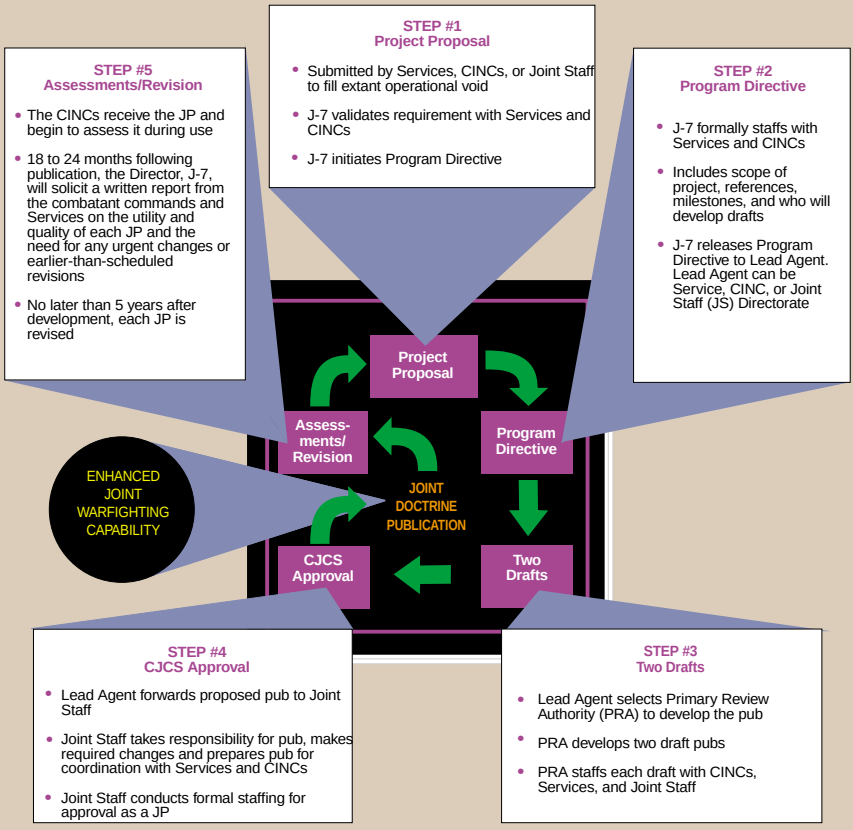
topographic engineering. Those engineering tasks that provide geospatial information and services to commanders and staffs across the range of military operations. These tasks include terrain analyses, terrain visualization, digitized terrain products, nonstandard map products, and baseline survey data. (JP 1-02)

Intentionally Blank

JOINT DOCTRINE PUBLICATIONS HIERARCHY



All joint doctrine and tactics, techniques, and procedures are organized into a comprehensive hierarchy as shown in the chart above. **Joint Publication (JP) 4-04** is in the **Logistics** series of joint doctrine publications. The diagram below illustrates an overview of the development process:




JOINT
CHIEFS OF STAFF